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ROSE CHEMICAL PROJECT
HOLDEN, MISSOURI

SITE INVESTIGATION
PRELIMINARY SITE ASSESSMENT REPORT

ADDENDUM NUMBER 1

October 30, 1987

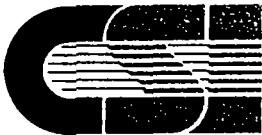
For
Clean Sites, Inc.
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Prepared by
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SEPT/87/0224i



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SUPERFUND RECORDS



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October 30, 1987

Mr. Jene L. Robinson
Chairman and PRPE
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Decatur, IL 62525

SUBJECT: Preliminary Site Assessment Report
Addendum 1 by John Mathes & Associates

Dear Jene:

Enclosed is the final issue of the Rose Chemicals Preliminary Site Assessment Report Addendum 1 prepared by John Mathes & Associates, Inc. This report has been reviewed by the Removals Task Force of the Rose Technical Subcommittee and CSI. Comments by the Task Force have been incorporated in this final report.

This report will be submitted to Steve Kinser, EPA Region VII, on November 4, by Cliff Kline. Also to be submitted along with the report will be the Phase 1 AOC Closeout Report and a letter certifying that all Phase 1 Statement of Work activities are complete. The Closeout Report and letter will be sent to you under separate cover.

With the issue of this report, the efforts of John Mathes & Associates, Inc., on preliminary site assessment work at the Rose Chemicals Site are completed.

Very truly yours,

Cliff
Clifford W. Kline
CSI Project Manager

WPL/sjr

Enclosures

CHAIRMAN OF THE BOARD/Russell E. Train PRESIDENT/Charles W. Powers BOARD OF DIRECTORS/Peter A.A. Berle,
Douglas M. Costle, Louis Fernandez, Sandra S. Gardebring, Edwin A. Gee, J'y D. Hair, Donald Kennedy, Joshua Lederberg,
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ROSE:reports/prelim_assess

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EXECUTIVE SUMMARY

John Mathes & Associates, Inc., (Mathes) was contracted by Clean Sites, Inc., (CSI) to perform a site investigation and preliminary site assessment at the Rose Chemical Facility in Holden, Missouri. The first two phases of fieldwork by Mathes were performed during the months of June and July 1987. The results of those efforts are summarized in the "Preliminary Site Assessment Report" dated July 31, 1987. Change Order No. 1 to the contract, issued on August 6, 1987, requested additional investigative activities to be performed.

The Mathes investigation and other previous investigations produced data that indicated the on-site soils contained varying levels of contamination by polychlorinated biphenyls (PCBs) and various volatile organic compounds (VOCs).

The Mathes investigation conducted in August and September 1987 (Phase III) consisted of the following activities:

- o surface soil sampling to assess the potential for surface water contaminant transport from the site (Samples were collected at six locations along the southern site boundary.);
- o geologic test drilling and soil sample collection in the Main Warehouse (nine locations) and the South Warehouse (two locations) to aid in the definition of the vertical and lateral extent of contaminant migration;
- o collection of data relevant to the occurrence and use of drinking water in the Holden, Missouri, area; and

- o collection and analysis of one groundwater sample from MW-201 to assess the on-site groundwater quality west of the South Warehouse.

Data and information collected during Phase III were evaluated by Mathes to refine the preliminary assessment covering the geology, surface and subsurface hydrology, and potential contaminant migration at the site.

The results of the Phase III activities indicate that soils underlying both the Main and South Warehouses are impacted. PCBs and volatile organic compounds (VOCs) were detected in samples from the soils underlying the Main Warehouse, but only PCBs were detected in samples from the soils underlying the South Warehouse.

The analytical data also indicate the presence of PCBs and VOCs in groundwater at the site. The cause of these compounds may be a spill west of the South Warehouse or migration of fluids through the floor slab in the building.

The only surface soil sample that contained detectable levels of any VOC or PCB was a sample from south of the South Warehouse (SS-5). The analysis of this sample reported measurable concentrations of toluene and xylenes. No USEPA Maximum Concentration Limit (MCL) is currently established for either of these compounds. Subsequent Priority Pollutant List (PPL) analyses of this same sample indicated the presence of PCBs.

The data collected on the occurrence and use of drinking water in the Holden, Missouri, area indicate that drinking water is obtained almost exclusively from surface water bodies. The data also indicate that groundwater in the area occurs in very low yields and very poor quality.

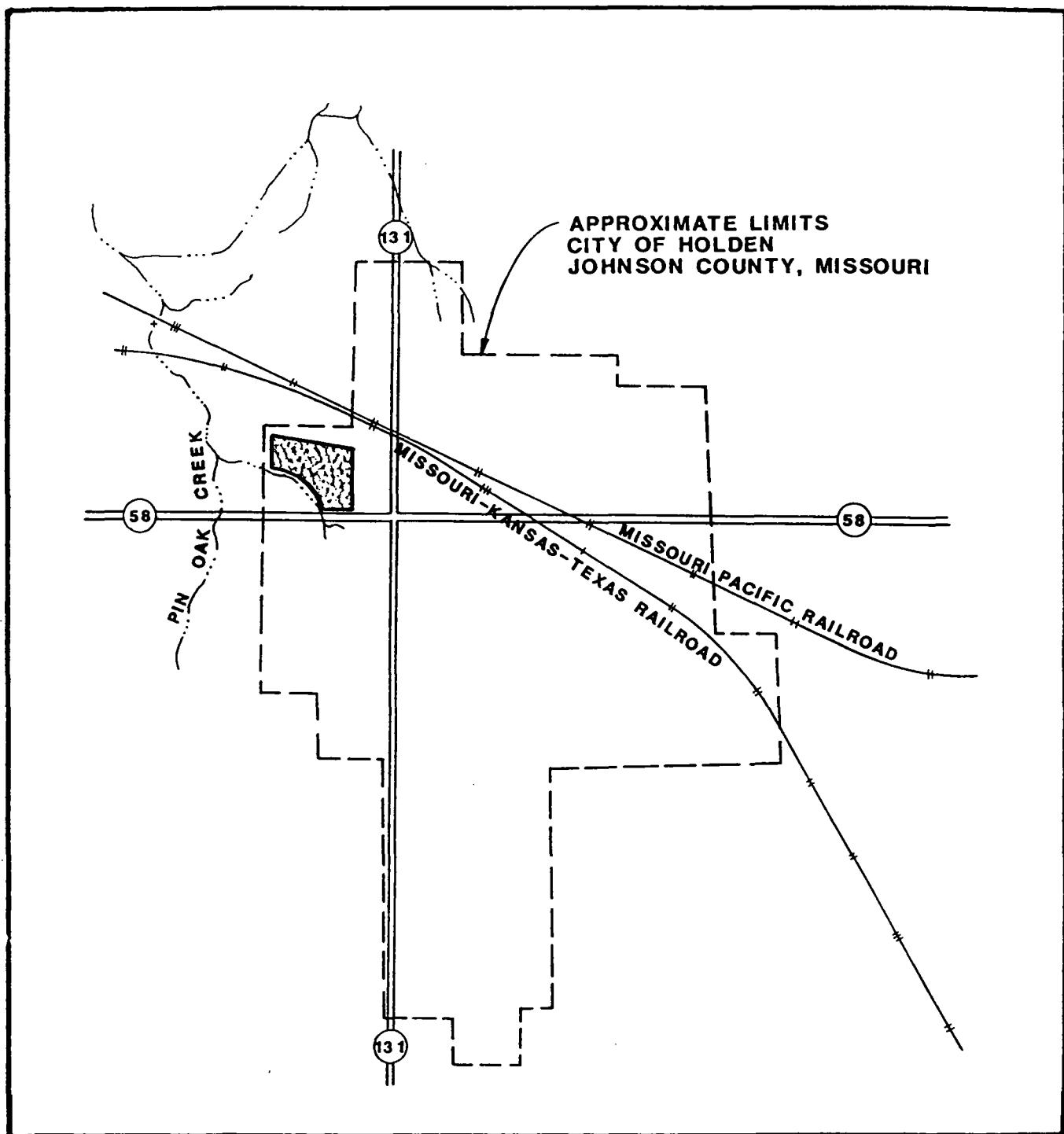
1 INTRODUCTION

This addendum report is a summary of the investigative activities performed by Mathes associated with refinement of a preliminary site assessment of the Rose Chemical Facility (the site) in Holden, Missouri (Figure 1). The report is intended as an addendum to the "Preliminary Site Assessment Report" dated July 31, 1987, prepared for CSI by Mathes. Holden is located in Johnson County in the western part of the state approximately 45 miles southeast of Kansas City. The Rose Chemical facility is located one block northwest of the intersection of Highways 58 and 131 within the city limits. Two warehouses are present at the site.

This work was performed in accordance with Contract Number CSI-SA-87.03, dated June 1987, and as modified by CSI in Change Order No. 1 dated August 6, 1987, and as described in the Mathes Workplan dated August 13, 1987. Change Order No. 1 is included as Appendix A to this report. The Mathes Workplan is included as Appendix B.

1.1 Previous investigations

Information used in the addendum report is from this and previous investigations at the site. Mathes performed two phases of investigative fieldwork at the Rose Chemical Site in June and July 1987. Data collected during the previous Mathes

**EXPLANATION****ROSE CHEMICAL FACILITY**

0 1000 2000
SCALE, FEET

**John Mathes & Associates, Inc.****SITE LOCATION MAP**

12872844

FIGURE 1

investigation included chemical and physical analyses of surface soil, subsurface soil, and groundwater samples.

The results of the previous Mathes investigation are summarized in the "Preliminary Site Assessment Report" dated July 31, 1987.

1.2 Phase III investigative objectives

The primary objective of this site investigation and the preliminary assessment was to collect on-site data that would assist in the refinement of the initial site hydrogeologic and contaminant characterization. The specific media of interest were the soils underlying the two warehouses and the soils at identified surface-water site-exit points. CSI informed U.S. Environmental Protection Agency (USEPA) Region VII of the investigation prior to initiation of on-site activities. A USEPA representative stated that these activities would not necessitate oversight by USEPA and that sample splits were not required.

1.3 Investigative scope and schedule

The Phase III investigation consisted of: soil sampling to bedrock in the Main Warehouse at nine locations, soil sampling to bedrock in the South Warehouse at two locations, and surface

soil sampling at six locations identified as potential surface-water site-exit points.

Certain tasks were performed related to the original scope of work. These tasks included staging of drums containing wastes generated during all phases of Mathes site activities and the collection of one groundwater sample from monitoring well MW-102. This well was not sampled during the earlier phases because of insufficient water. The drums containing drill cuttings, soils, and water from all Mathes field activities were staged inside the Main Warehouse.

The scope of work as described above was performed during the period August 24 to September 24, 1987.

1.4 Additional investigative activities

As part of the Change Order No. 1 scope of work, Mathes collected information from various state, local, and federal agencies on groundwater occurrence and use in the Holden, Missouri area. Local water well drillers were contacted to obtain additional information not found in agency records.

2 PHASE III INVESTIGATIVE ACTIVITIES

Phase III activities included sampling of soils underlying the two warehouse floors, surface soil sampling at locations along the southern boundary of the site, collection of data on groundwater use and occurrence, and the collection of one groundwater sample from MW-201.

The surface soil samples were analyzed for VOCs only. All other soil and groundwater samples were analyzed for VOCs and PCBs. One soil sample from each of the warehouses and one of the surface soil samples were submitted for PPL analyses. The samples submitted for PPL analyses were those that displayed the highest levels of VOCs or PCBs in the respective area or media.

2.1 Main Warehouse floor coring and soil sampling

2.1.1 Objective

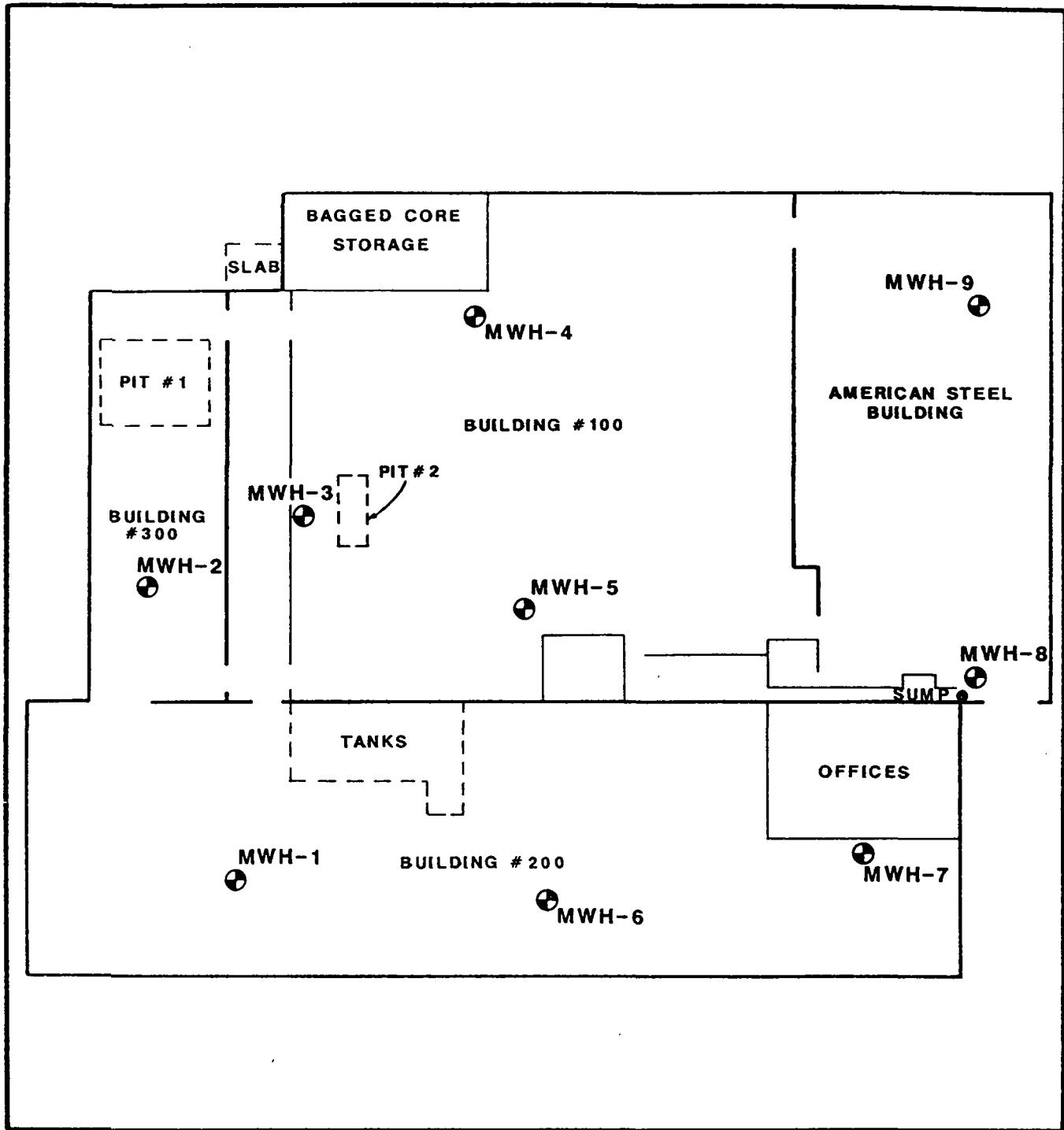
The objective of the geologic test drilling and soil sampling in the main warehouse was to refine the preliminary assessment provided by the data obtained in Phase II. Phase II results indicated the presence of certain contaminants in the soils underlying the floor slabs. Phase III data was to provide additional information on the vertical and lateral extent of contaminant distribution.

2.1.2 Sampling locations

Nine Main Warehouse sampling "approximate locations" were selected by CSI based on previous investigations and historical information on warehouse use. Figure 2 presents the Phase III locations drilled in the Main Warehouse. The Main Warehouse shallow soil borehole geologic logs are included in Appendix C.

2.1.3 Sampling methodology

At each location, an electric coring-machine was used to penetrate the concrete floor. The concrete core was removed along with any small amounts of rock under the floor. A two-inch diameter split-spoon sampler was then driven to a depth of approximately one-and-one-half feet beneath the base of the concrete. The sample was retrieved from the split spoon, logged, scanned for organic vapors, and composited for chemical analysis. All samples were submitted to Langston Laboratories in Kansas City, Kansas, to be extracted and stored for potential analysis. The borehole was then augered to the depth of the bottom of the retrieved sample. The above procedure was repeated with a precleaned split-spoon sampler to the total depth of each borehole. A total of 68 samples were submitted to Langston Laboratories for potential analysis.



EXPLANATION

MWH-4
BOREHOLE LOCATION



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**MAIN WAREHOUSE
BOREHOLE AND SOIL
SAMPLING LOCATIONS**

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FIGURE 2

NOTE: Locations of interior walls and physical features are approximate.

Elevated (above ambient) organic vapor concentrations were observed at the boreholes after penetration of the concrete at all sampling locations except MWH-8. The concentrations observed during headspace analyses are presented in Table 1 and are shown by depth at each borehole in Figure 3.

2.2 South Warehouse floor coring and soil sampling

2.2.1 Objective

The objective of the geologic test boreholes and soil sampling in the South Warehouse was to provide initial information for a preliminary assessment of chemical characterization of the soils underlying the warehouse floor. The data would be used to show a correlation or lack of correlation between soils under the South Warehouse and the detection of VOCs in soil gas (Phase II soil-gas investigation) west of the South Warehouse.

2.2.2 Sampling locations

Two South Warehouse sampling "approximate locations" were selected by CSI. Figure 4 is a map of the Phase III sampling locations drilled in the South Warehouse. Geologic logs for the South Warehouse shallow soil boreholes are included in Appendix C.

Table 1

**ROSE CHEMICAL FACILITY
WAREHOUSE AREA SOIL SAMPLES
HEADSPACE MONITORING RESULTS**

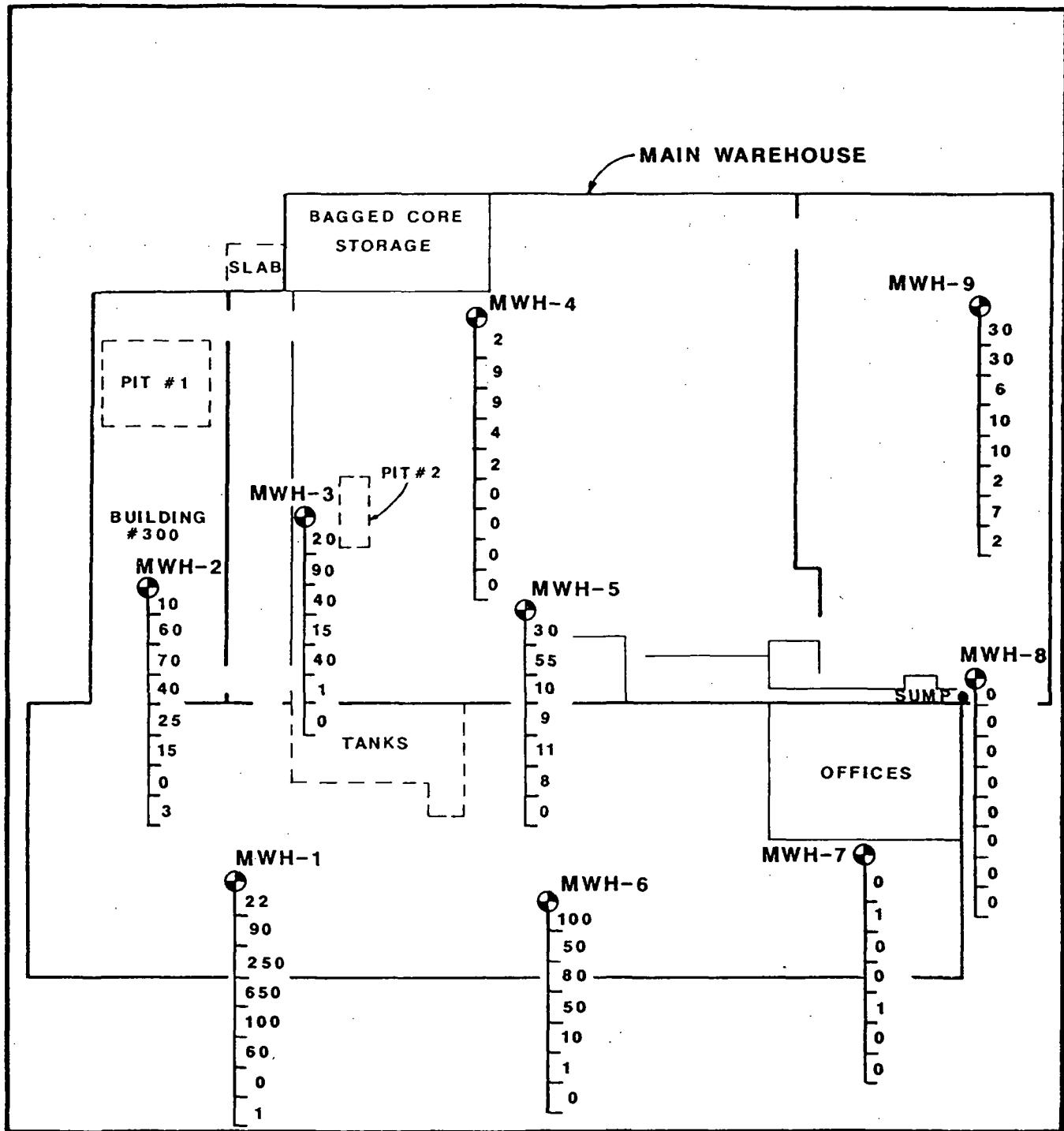
Borehole Location: <u>Depth (Feet)</u>	Organic Vapor Concentration (NDUs)										
	MWH-						SWH-				
	1	2	3	4	5	6	7	8	9	10	11
0.5 - 2.0	22	10	20	2	30	100	0	0	30	60	320
2.0 - 3.5	90	60	90	9	55	50	1	0	30	3	85
3.5 - 5.0	250	70	40	9	10	80	0	0	6	10	50
5.0 - 6.5	650	40	15	4	9	50	0	0	10	NS	NS
6.5 - 8.0	100	25	40	2	11	10	1	0	10	NS	NS
8.0 - 9.5	60	15	1	0	8	1	0	0	2	NS	NS
9.5 - 11.0	0	0	0	0	0	0	0	0	7	NS	NS
11.0 - 12.5	1	3	NS	0	NS	NS	NS	0	2	NS	NS

Notes: MWH = sampling locations in the Main Warehouse.

SWH = sampling locations in the South Warehouse.

NS = specific sample not collected.

NDUs = needle deflection units. These correspond approximately to total parts per million organics in air as observed on air monitoring devices.



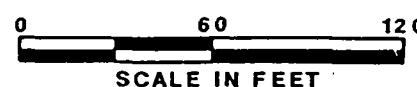
EXPLANATION

MWH-4

BOREHOLE LOCATION



ORGANIC VAPOR READING (NDUs)
BY DEPTH (1.5 FEET INTERVALS)

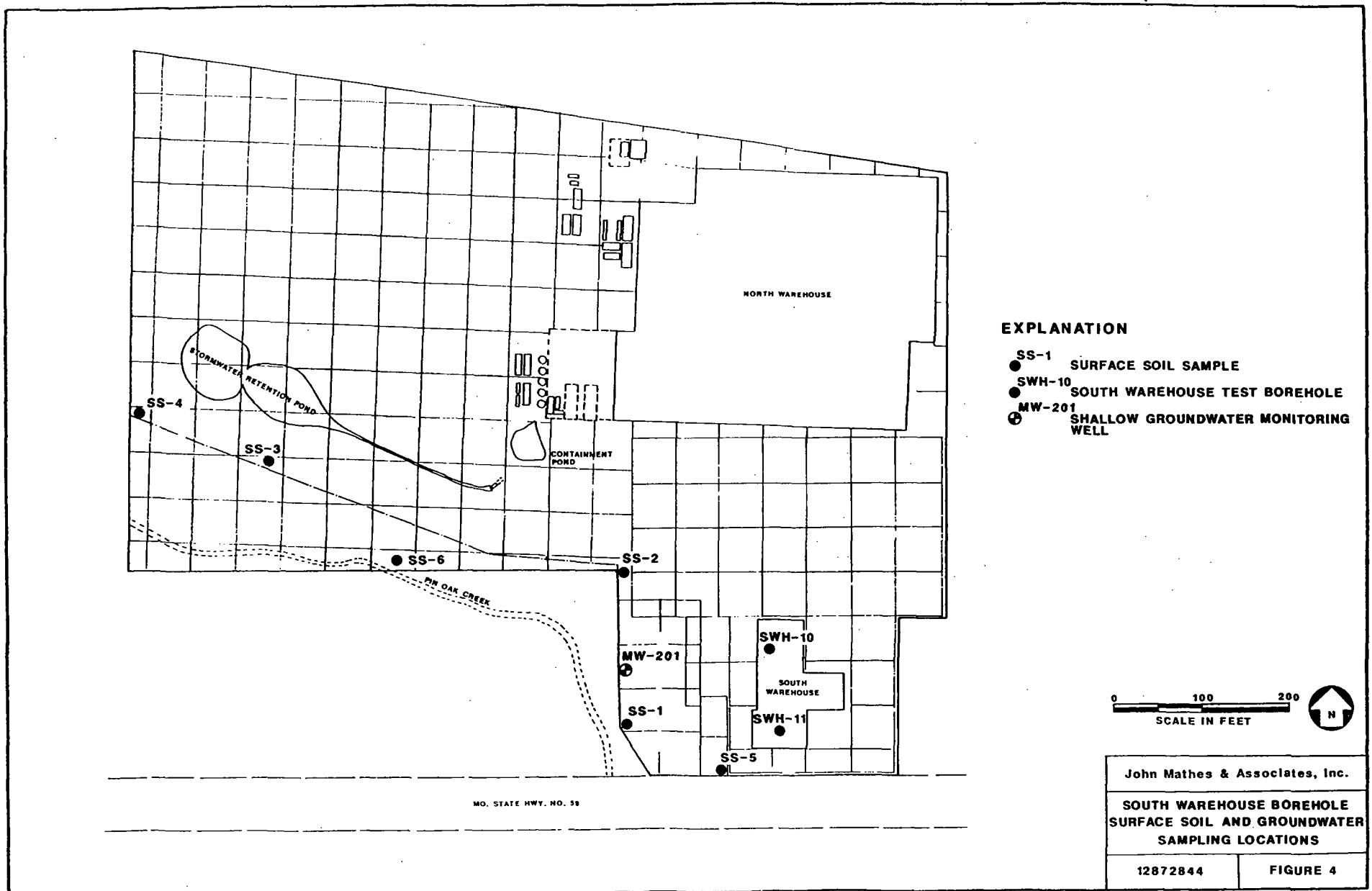


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OBSERVED ORGANIC
VAPOR READINGS
BY DEPTH

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FIGURE 3



2.2.3 Sampling methodology

At each location, an electric coring-machine was used to penetrate the concrete floor. The concrete core was removed along with any small amounts of rock under the floor. The procedures for drilling and soil sample collection are detailed in Section 2.1.3.

2.3 Surface soil sampling

2.3.1 Objective

The objective for the collection and analysis of surface soil samples was to assess potential surface-water site-exit points for the presence of VOCs. The sample having the highest concentrations of VOCs would then be analyzed for all parameters on the USEPA PPL.

2.3.2 Locations

The six sampling locations were selected by CSI based on each location's potential as a site surface-water discharge point. Figure 4 is a map of the sampling locations.

2.3.3 Sampling methodology

All surface-soil sampling locations were sampled to a depth of six inches with a precleaned, stainless-steel hand-auger. Surface vegetation was removed prior to sampling. All surface soil samples were submitted to Langston Laboratories for VOCs analysis.

2.4 Additional activities

In addition to the sampling of surface and subsurface soils, one groundwater sample was collected and information was obtained from several sources on the use and occurrence of drinking water in the Holden, Missouri, area.

2.4.1 Groundwater sampling

A groundwater sample was not collected from monitoring well MW-201 during Phase II because of insufficient water. During Phase III, however, groundwater was present in the well and a sample was collected. Phase III activities, took place after a significant precipitation event and it was possible to

collect a sample. During Phase III routine collection of water level measurements, Mathes personnel noted several feet of water in MW-201. The well was purged, a sample was collected and sent to Langston Laboratories for analysis (VOCs and PCBs).

2.4.2 Holden, Missouri, area public water supply data collection

Phase III data was collected and evaluated to refine the Phase II assessment of water use and occurrence. Publications and records from, as well as personal communications with, agency personnel and local drillers were used in this refinement.

3 PRELIMINARY SITE ASSESSMENT REFINEMENT

Results of Phase III data collection and analysis are used to refine the preliminary site assessment as reported by Mathes to CSI in the "Preliminary Site Assessment Report", dated July 31, 1987.

3.1 Site surface-water hydrology

The site is located approximately one mile north of a major surface drainage divide that separates the Black River basin, to the north, from the South Grand River basin to the south. Surface-water on-site flows primarily south-southwest to an unnamed tributary to Pin Oak Creek. Pin Oak Creek flows north to the Black River.

Surface-water appears to exit the site primarily at five locations. These are identified as sampling points SS-1 through SS-5 on Figure 4. Location SS-6 is the discharge point of the old drainage system. This location is currently disconnected, and all water previously moving through it is diverted to the storm water retention ponds.

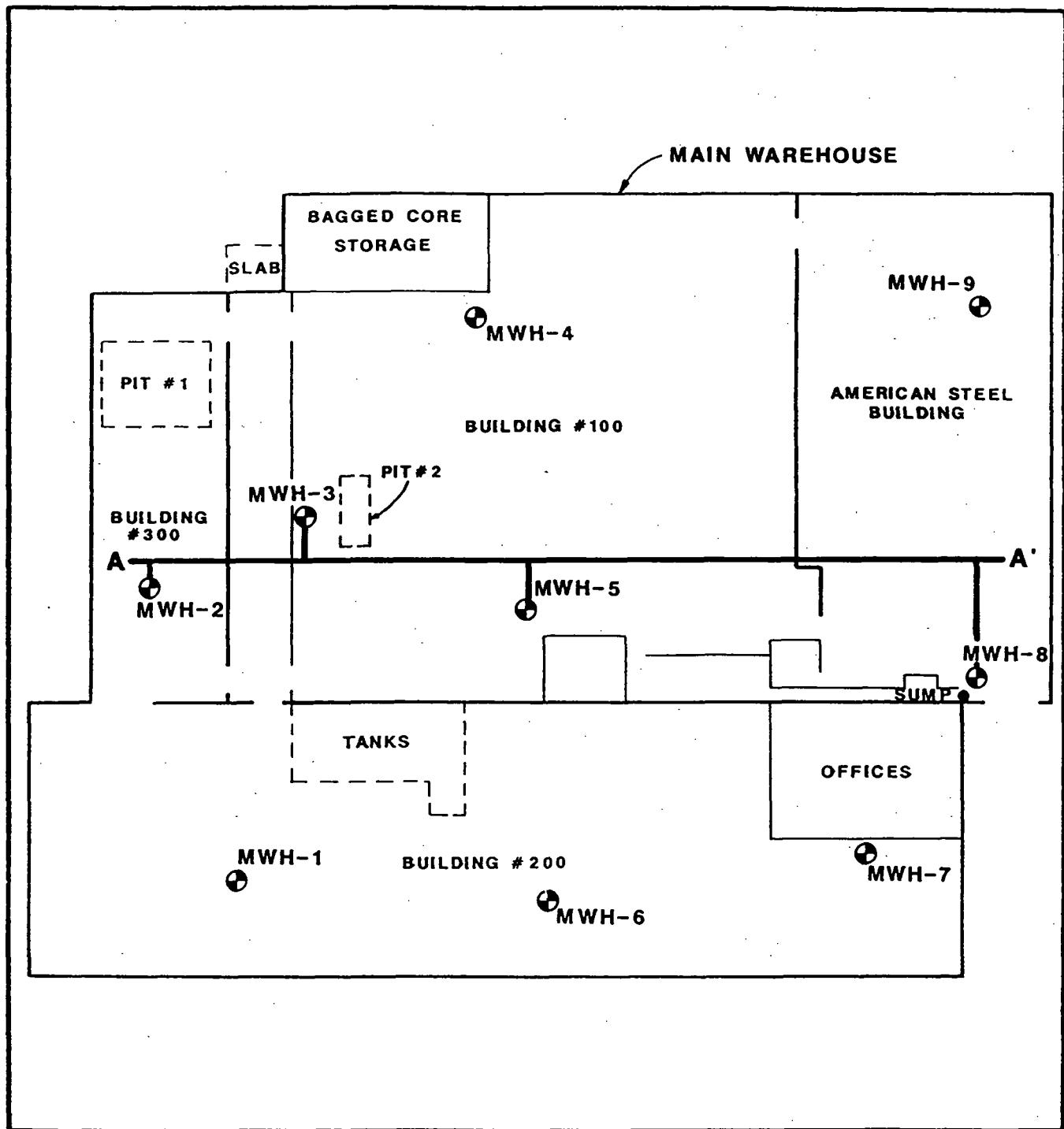
3.2 Site geology

Geologic test boreholes drilled during Phase III penetrated to the top of bedrock only. The uppermost bedrock unit in the area of the Main Warehouse is shale at an approximate depth of 12 feet. Figure 5 is a map of the Main Warehouse showing the location of a generalized geologic cross-section that is presented in Figure 6. This cross-section is consistent with the geologic section as extended from geologic test boreholes TB-3 through TB-2 into the area of the Main Warehouse. Shale in this area is covered by a layer of weathered shale residuum.

The two boreholes in the South Warehouse penetrated limestone at a depth of approximately four to five feet. This limestone probably represents a stringer in the uppermost shale unit not encountered in geologic test borehole TB-1. If the limestone represents the bedrock surface, then the surface slopes to the west towards the unnamed tributary that runs along the site.

3.3 Site hydrogeology

Water level measurements taken during Phase III indicate flow directions in the shallow and deep water-bearing zones to be consistent with those from earlier work. The flow direction in the shallow zone is to the south-southwest (Figure 7).

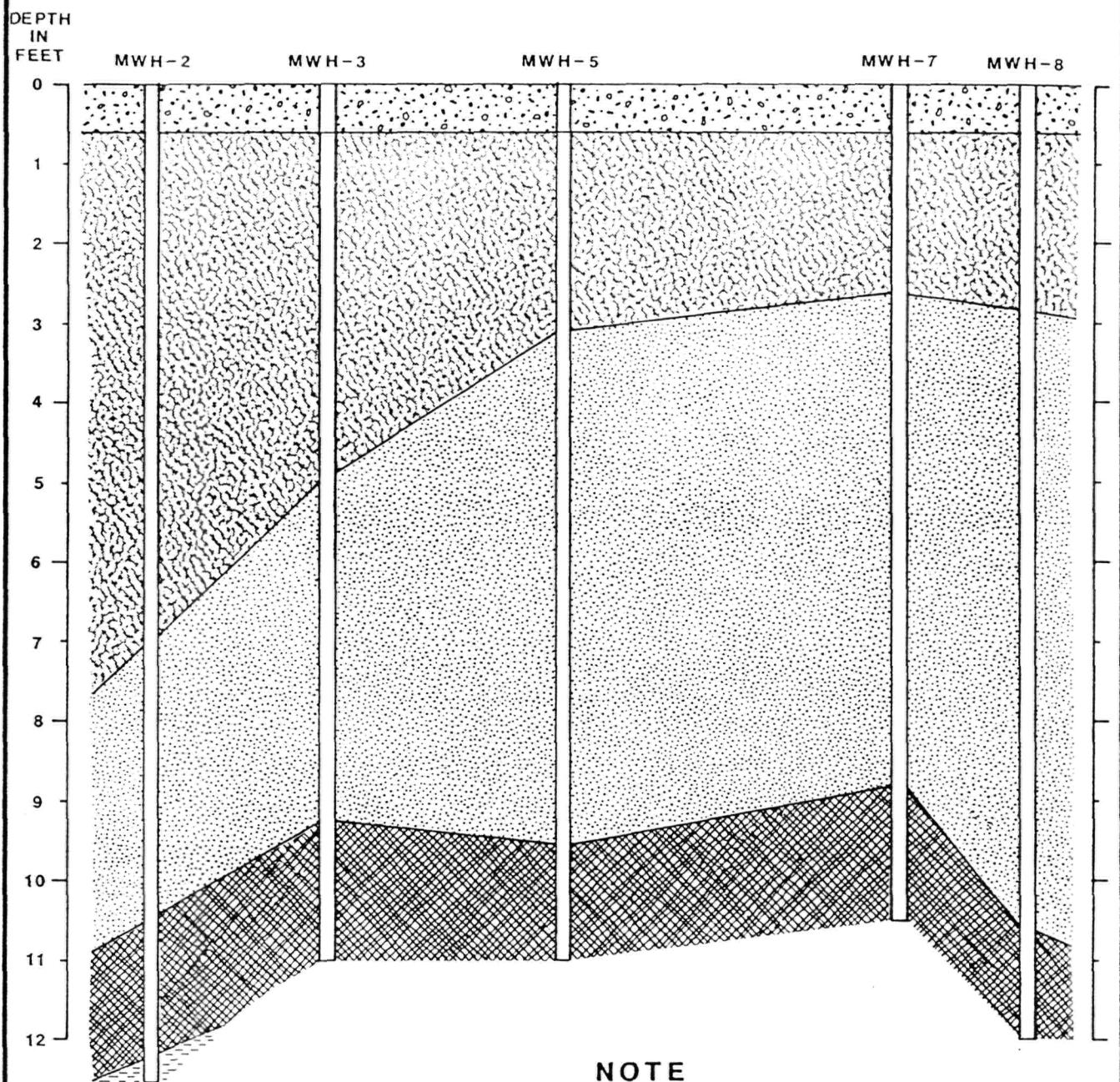
**EXPLANATION****A ————— A' CROSS SECTION LOCATION**

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CROSS SECTION LOCATION

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FIGURE 5

**NOTE**

This profile was developed by interpolation between widely spaced boreholes. Only at the borehole locations should it be considered as an approximately accurate representation and then only to the degree implied by the notes on the drilling logs.

EXPLANATION

- CONCRETE
- FILL
- CLAY
- WEATHERED SHALE WITH CLAY (RESIDUUM)
- SHALE

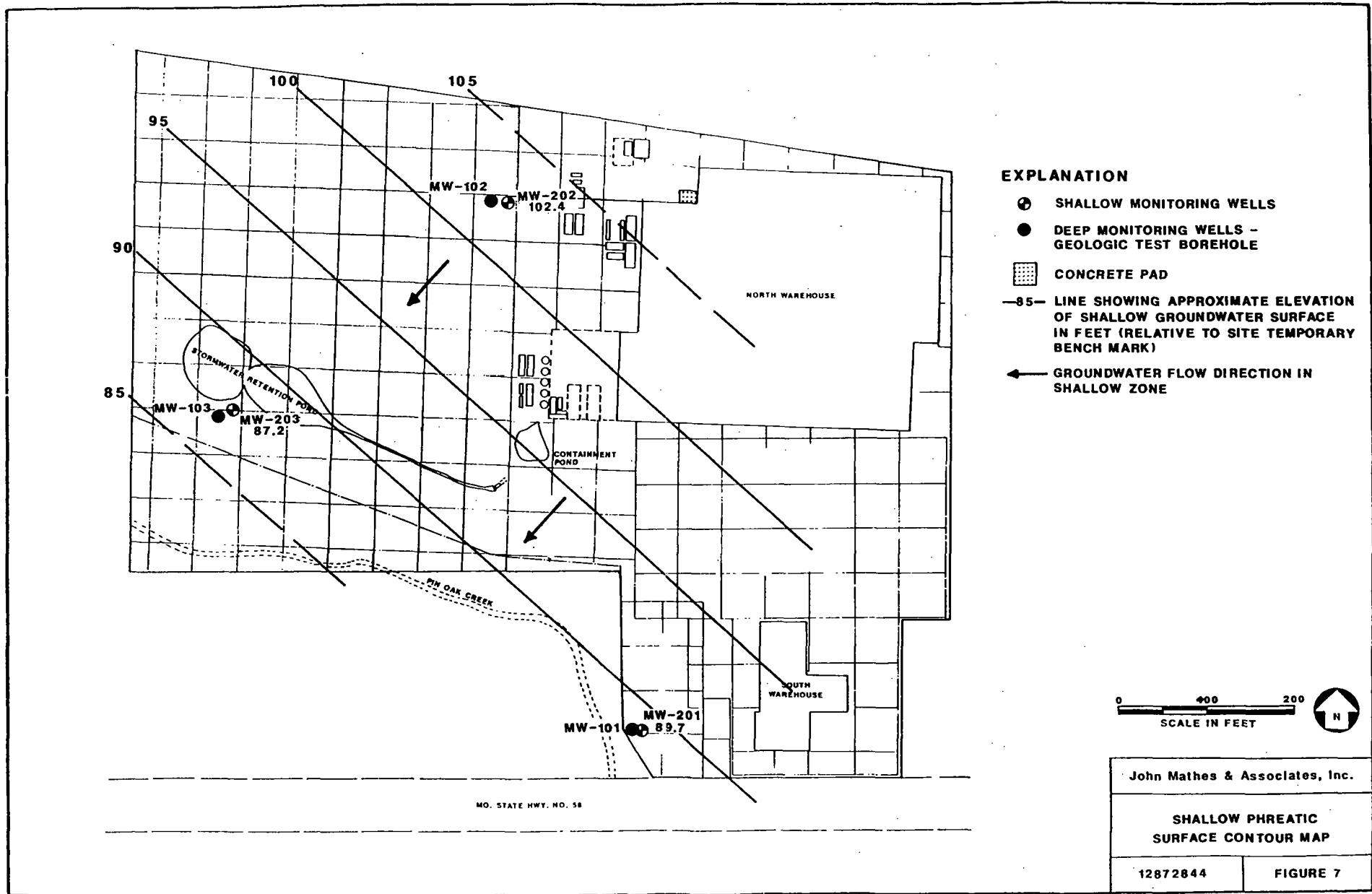
VERTICAL SCALE IN FEET
0 2 4
0 60 120
HORIZONTAL SCALE IN FEET

John Mathes & Associates, Inc.

MAIN WAREHOUSE AREA
GENERALIZED GEOLGIC
CROSS-SECTION

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FIGURE 6



3.4 Holden, Missouri, area water supply

Information used in the assessment of the Holden, Missouri area public and private water supply was obtained from:

- o Missouri Department of Natural Resources, Division of Environmental Quality (Public Drinking Water Program), Jefferson City, Missouri;
- o Missouri Department of Natural Resources, Division of Geology and Land Survey, Water Resources Section, Rolla, Missouri;
- o City of Holden utility department, Johnson County Water Supply District No. 2; and
- o local (Holden area) water well drillers.

In general, the groundwater in the Holden, Missouri, area is considered to be of poor quality. This is consistent with information reported by Gann and others (1974) and by Schroeder (1982). The major problems include low yield and high concentrations of total dissolved solids (TDS), chlorides, sulfur, and sodium. The Missouri Department of Natural Resources (MDNR) reported that water-bearing formations encountered above 400 feet are low-yield (Robertson, 1962) and that below 400 feet water may not be potable (Fuller, 1962).

A search of the MDNR well logs was conducted. Two wells were on record at the MDNR as being within two miles of the site. Notes on the logs indicate that neither of these wells were completed or produced any water. Twelve additional wells were on record as being within the same township (Township 45 North, Range 28 West). Copies of all well logs are included in Appendix G. No additional wells were discovered during a

search of State of Missouri permits or proposed wells. It is possible that further investigations could locate additional wells, but the water quality in those wells should be similar to that reported.

One revision to the previous report on groundwater use in the Holden area is that the two man-made lakes located two miles east of Holden are no longer used for the city water supply. They have both been sold to a resident of Odessa, Missouri, who is using them strictly for recreation. The old city well was sold to the same person who reportedly has never used it (verbal communication). The City of Holden is currently using a new lake located approximately two miles west of the city.

3.5 Analytical data evaluation

Analytical data from surface soils, soils underlying the Main and South Warehouses, and groundwater were evaluated. All analytical tests were conducted by Langston Laboratories. The tests performed included VOCs on the surface-soil samples, VOCs and PCBs on the warehouse-area soil samples, and VOCs and PCBs on the groundwater sample. One surface-soil sample and one soil sample from each of the eleven warehouse boreholes were analyzed for the Priority Pollutant List (PPL) parameters. The

samples selected for PPL analyses were those in which the highest levels of VOCs or PCBs were detected in the first analysis.

3.5.1 Groundwater data

Two VOCs were detected in the groundwater sample from MW-201. These were trichloroethene (TCE) at 740 micrograms per liter (ug/L) and 1,2-dichloroethene (DCE) at 87 ug/L. The PCB Aroclor 1260 was also detected in this sample at a concentration of 0.68 ug/L. The detection limit for PCBs was 0.1 ug/L; the detection limit for VOCs was 5 ug/L. The groundwater sample analytical data is included as Appendix F.

3.5.2 Surface soils data

VOCs were detected in only one surface-soil sample (SS-5). Toluene and xylenes were detected at concentrations of 610 ug/kg and 560 ug/kg, respectively. The detection limits for VOCs in surface soils were from 0.5 mg/kg to 1.0 mg/kg. PPL parameters were analyzed in sample SS-5. PCBs were detected at concentrations of 9.0 mg/kg (Aroclor 1242) and 240 mg/kg (Aroclor 1260) in this sample. The results of the PPL analyses are presented in Table 2.

Table 2

**ROSE CHEMICAL FACILITY
PRIORITY POLLUTANT LIST ANALYSES**

Parameter	Concentration (mg/kg) in sample number		
	SS-5	MWH5-2	SWH11-2
<u>INORGANICS</u>			
Antimony	6.1	4.6	2.5
Beryllium	0.44	0.65	0.82
Cadmium	3.1	2.8	3.9
Chromium	12.3	12.7	20.0
Copper	20.4	13.5	20.5
Lead	34	ND	ND
Nickel	19.4	15.8	27.3
Silver	0.5	0.31	0.19
Thallium	6.4	2.8	3.1
Zinc	165	29.4	63.4
Cyanide	0.14	0.01	0.04
<u>PCBs</u>			
Aroclor 1242	9.0	9.0	9.5
Aroclor 1260	240	100	6.0
<u>BASE NEUTRAL ORGANICS</u>			
1,2,4-Trichlorobenzene	ND	48.0	ND

Notes: SS = surface soil sample.

MWH = soil sample underlying Main Warehouse floor slabs.

SWH = soil sample underlying South Warehouse floor slabs.

ND = not detected.

3.5.3 Warehouse area soils data

No VOCs were detected in any of the warehouse soil samples. PCBs were detected in samples from six of the nine boreholes in the Main Warehouse and from both of the boreholes in the South Warehouse (Table 3). These results are discussed in the following sections.

3.5.3.1 Main warehouse soils data

The only boreholes with samples that contained levels of PCBs above 1.0 mg/kg were MWH-5 and MWH-6. Borehole MWH-5 is located in Building No. 100 (as identified by the Chemical Waste Management system) northwest of the tool/maintenance room. Borehole MWH-6 is located in Building No. 200 south of the tool/maintenance room and east of the horizontal tanks. Figure 8 is a map of the highest concentrations of PCBs detected in any of the samples from each borehole in the Main Warehouse.

PCBs were detected in MWH-5 samples from 0.5 to 2.0 feet (Aroclor 1242 - 7.9 mg/kg, Aroclor 1260 - 107 mg/kg) and from 2.0 to 3.5 feet (Aroclor 1242 - 9.0 mg/kg, Aroclor 1260 - 100 mg/kg). In the sample from 3.5 to 5.0 feet at location MWH-5, only Aroclor 1260 was detected (0.8 mg/kg). PCBs were detected in the MWH-6 samples from 0.5 to 2.0 feet (Aroclor 1242 and

Table 3

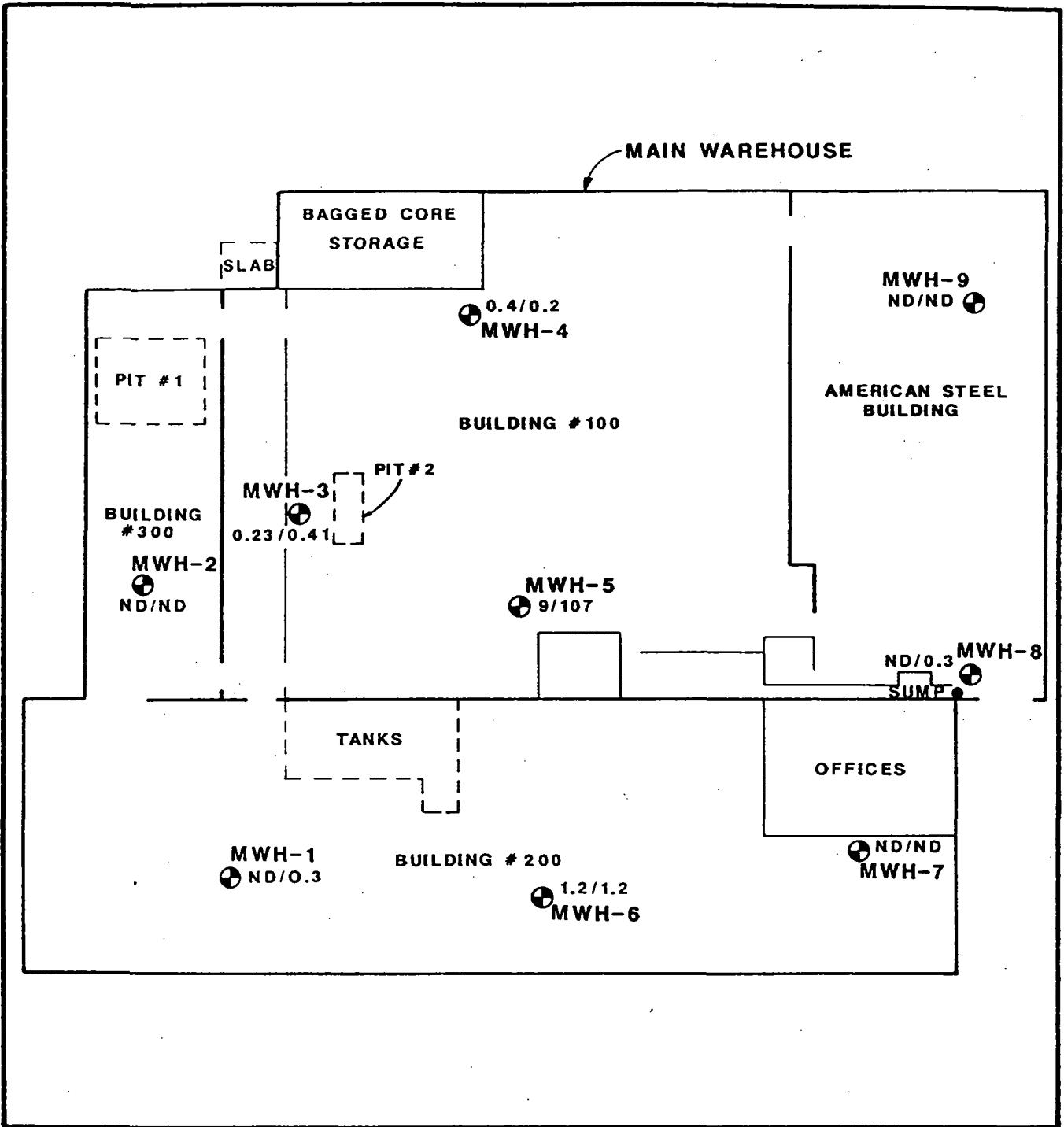
**ROSE CHEMICAL FACILITY
WAREHOUSE AREA SOIL SAMPLES
PCB ANALYTICAL RESULTS**

Borehole Location	Sample Depth (feet)	PCBs Concentration (mg/kg)	
		Aroclor 1242	Aroclor 1260
MWH-1	0.5 - 2.0	ND	0.3
	2.0 - 3.5	ND	ND
MWH-2	0.5 - 2.0	ND	ND
	2.0 - 3.5	ND	ND
MWH-3	0.5 - 2.0	0.23	0.41
	2.0 - 3.5	ND	ND
MWH-4	0.5 - 2.0	ND	0.2
	2.0 - 3.5	0.4	ND
MWH-5	0.5 - 2.0	7.9	107
	2.0 - 3.5	9.0	100.0
	3.5 - 5.0	ND	0.8
MWH-6	0.5 - 2.0	1.2	1.2
	2.0 - 3.5	0.59	0.50
MWH-7	0.5 - 2.0	ND	ND
	2.0 - 3.5	ND	ND
MWH-8	0.5 - 2.0	ND	ND
	2.0 - 3.5	ND	0.3
MWH-9	0.5 - 2.0	ND	ND
	2.0 - 3.5	ND	ND
SWH-10	0.5 - 2.0	1.7	8.8
	2.0 - 3.5	ND	ND
SWH-11	0.5 - 2.0	ND	ND
	2.0 - 3.5	9.5	6.0
	3.5 - 5.0	ND	ND

Notes: MWH = sampling locations in the Main Warehouse.

SWH = sampling locations in the South Warehouse.

ND = specific Aroclor was not detected in the samples.



EXPLANATION

MWH-4

**BOREHOLE LOCATION SHOWING
0.4/0.2 HIGHEST LEVELS OF AROCLOR 1242/
AROCLOR 1260**



John Mathes & Associates, Inc.

**MAIN WAREHOUSE SOIL SAMPLES
MAXIMUM DETECTED PCBs BY
BOREHOLE AND AROCLOR**

12872844

FIGURE 8

1260 - each 1.2 mg/kg) and from 2.0 to 3.5 feet (Aroclor 1242 - 0.59 mg/kg, Aroclor 1260 - 0.5 mg/kg). Results of the PPL analyses are presented in Table 2.

3.5.3.2 South Warehouse soils data

PCBs were detected in samples from both boreholes located in the South Warehouse at concentrations greater than 1.0 mg/kg. PCBs were detected only in the uppermost sample (0.5 to 2.0 feet) from borehole SWH-10 (Aroclor 1242 - 1.7 mg/kg, Aroclor 1260 - 8.8 mg/kg). No PCBs were detected in the sample from this borehole collected from a depth of 2.0 to 3.5 feet.

No PCBs were detected in the uppermost sample (0.5 to 2.0 feet) from borehole SWH-11, but PCBs were detected in the sample collected from a depth of 2.0 to 3.5 feet (Aroclor 1242 - 9.5 mg/kg, Aroclor 1260 - 6.0 mg/kg). Analyses for PPL parameters were performed on soil samples from MWH-5 (0.5 to 2.0 feet) and SWH-11 (2.0 to 3.5 feet). Results of the PPL analyses are presented in Table 2.

4 CONCLUSIONS

The results of the Phase III investigation, in conjunction with the initial assessment reported to CSI July 31, 1987, by Mathes; indicate that:

1. In areas within the Main Warehouse, the extent and magnitude of PCB- and/or VOC-impacted soils appear to be related to the proximity of floor slab joints and/or cracks and visible traces of spills. The Phase II warehouse sampling locations were selected on the basis of the proximity to spills and floor joints or cracks. VOCs were detected in three of the six Main Warehouse soil samples during Phase II. PCBs were detected in five of the six locations at concentrations above 1.0 mg/kg.

The Phase III locations were selected to give a broader characterization of soils in the area and therefore were not necessarily in an area of both spills and cracks in the floor. No VOCs were detected in soil samples from any of the Phase III locations. PCBs were detected in only one of the nine locations at concentrations above 1.0 mg/kg.

2. VOCs were not detected in samples from either of the South Warehouse boreholes. PCBs (at concentrations of less than 10.0 mg/kg) were detected in samples from both boreholes.
3. VOCs and PCBs were detected in the groundwater sample collected from monitoring well MW-201. Data collected during the Phase I soil gas investigation indicated the presence of VOCs in the soils west of the South Warehouse. The highest detected concentrations of VOCs in soil gas were also in the vicinity of monitoring well MW-201. This indicates that based on present information, the most likely source of the VOCs in the groundwater sample are from the soils in the vicinity of the monitoring well.

Since PCBs were detected in soil samples from the South Warehouse and in surface soil samples from the areas of the South Warehouse and the monitoring well, no conclusions can be drawn on the source area.

4. The information collected to date does not allow definitive conclusions to be drawn regarding the potential for off-site migration of the groundwater sampled in MW-201.

REFERENCES

- Fuller, Dale L., 1962, Water quality map of deep aquifers in Missouri: State of Missouri, Division of Water Survey and Water Resources (March 1963).
- Gann and others, 1974, Hydrologic Investigations Atlas HA-491, Water resources of west-central Missouri: U.S. Geological Survey.
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- Clean Sites, Inc., 1987, Preliminary Site Assessment Report, Submitted by John Mathes & Associates, Inc., July 31.
- Robertson, Charles E., 1962, Water well yield map of Missouri, State of Missouri: Division of Water Survey and Water Resources (March 1963).
- Schroeder, Walter A., 1982, Water Atlas - Missouri Water Atlas, Missouri Department of Natural Resources: Division of Water Resources and Division of Environmental Quality.

ROSE CHEMICAL
ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

APPENDIX A

Contract Change Order No. 1

RECEIVED AUG-7 1987



CLEAN SITES INC

1199 NORTH FAIRFAX STREET / ALEXANDRIA VIRGINIA 22314 / 703-683-8522

TELECOPIER NO. 703-548-8773

MIDWEST REGIONAL OFFICE: 1400 E. TOUHY AVENUE / SUITE 215 / DES PLAINES, IL 60018 / 312-635-7580

August 6, 1987

Jeffrey D. Young
John Mathis & Associates, Inc.
210 West Sand Bank Road
Columbia, IL 62236

Subject: Change Order No. 1
Preliminary Site Assessment
Contract No. CSI-SA-87.03

Dear Jeff:

Enclosed are the Expanded Work Scope and change order forms that we would like you to use for preparing a work plan, schedule and estimate of additional site assessment work at Rose. Please fill in the change order forms using the Contract prices and provide backup to support the change estimate. In preparing the work plan and schedule, mobilization should be assumed to be August 24.

Please submit the detailed workplan, schedule and change estimate to me on August 14. This will allow review with several of the PRP Technical Subcommittee members visiting Alexandria on August 17. If you have any questions, please call me at (703) 683-8522.

Very truly yours,

A handwritten signature in black ink that appears to read "Phil".

W. P. Laughlin
Manager, Project Controls

bcd

cc: J. J. Kohanek
K. E. Norman
R. J. Robinson
N. W. Newkirk

File 5.02.03/6.06.02

ATTEN:
W.P. LAUGHLIN



New England Power Service

New England Power Service Company
25 Research Drive
Westborough, Massachusetts 01581
Tel. (617) 366-9011

August 6, 1987

TO: ROSE CHEMICALS TECHNICAL SUBCOMMITTEE
FROM: J. M. Kwasnik
RE: ROSE CHEMICALS SITE - PRELIMINARY SITE ASSESSMENT - EXPANDED WORK SCOPE

Enclosed please find a final Supplemental Scope of Work which has been revised from the draft Supplemental Scope of Work dated July 27, 1987. The final Supplemental Scope of Work was revised to reflect comments received from the Technical Subcommittee.

With this final Supplemental Scope of Work, Robin Robinson of Clean Sites, Inc., will request a detailed work plan, schedule and cost estimate from J. Mathes and Associates, Inc., for conducting the additional work.

Very truly yours,

Joseph M. Kwasnik
Joseph M. Kwasnik

JMK:gv

Enclosure

cc: J. A. Callison, NEPSCO
G. E. Johnson, IPS
J. L. Robinson, IP
R. Robinson, CSI

M. C. ROSE CHEMICALS SITEPreliminary Site AssessmentSupplemental Scope of Work

August 6, 1987

I. Introduction

The Rose Chemicals Technical Subcommittee sponsored a preliminary site assessment which was conducted by J. Mathes & Associates, Inc., at the Rose Chemicals site in Holden, Missouri. The assessment was conceived and conducted to determine the site groundwater regime, surficial and bedrock stratigraphy and contaminant potential in the subsurface soils both external and internal to the North and South warehouses. The information gathered by the assessment would also be utilized to develop order of magnitude costs of remediation expected at the site.

With knowledge of remediation costs at the site and confidence that the preliminary assessment had uncovered the full extent of contamination at the site, the Technical Subcommittee expected to recommend a "buy-out" unit cost and "buy-out" premium percent.

Upon review of preliminary data supplied to the Technical Subcommittee by J. Mathes & Associates, Inc., a majority of the Technical Subcommittee members expressed varying degrees of concern about the extent of contamination beneath the two onsite buildings, potential of contamination of drinking water aquifers under the site and surface migration of non-PCB contaminants. These uncertainties prompted the Technical Subcommittee to authorize a supplemental Scope of Work at the site to be conducted by J. Mathes & Associates, Inc.

II. Purpose of Supplemental Scope of Work

The purpose of the supplemental Scope of Work is development of additional data from the site which will address and satisfy the uncertainties of the Subcommittee majority and ultimately allow the Subcommittee to recommend a "buy-out" unit cost and "buy-out" premium percent.

III. Conduct of Supplemental Scope of Work

This Scope of Work has been developed for the Rose Chemicals Technical Subcommittee. Clean Sites, Inc. (CSI-R. Robinson) will administrate the implementation of the Scope of Work with J. Mathes & Associates, Inc. (contractor). CSI will request a proposal/work plan and budget cost and schedule from J. Mathes for this work. This proposal/work plan and budget cost will be forwarded to the Subcommittee for final authorization to proceed with the expanded Scope of Work. Following authorization, CSI will contract with J. Mathes to implement the work.

- 2 -

IV. Scope of Work

This supplemental Scope of Work is designed to address issues of site contamination which were raised following review of the preliminary site assessment conducted by J. Mathes & Associates, Inc., at the Holden, Missouri facility. The issues can be categorized as follows:

- The subsurface contamination beneath the North warehouse needs to be further defined with respect to vertical/lateral distribution of contaminants. Also, the potential for subsurface contamination beneath the South warehouse also needs to be addressed.
- Surface contamination from runoff of non-PCB contaminants to the adjacent Pin Oak Creek needs to be addressed.
- Potential for contamination of the potable water bearing strata below the Rose site needs to be addressed.

The tasks to be conducted under the Supplemental Scope of Work are described as follows:

Task A

Contractor shall penetrate the concrete floor of the North and South Warehouse buildings and conduct soil borings at the eleven (11) locations (or the vicinities) shown on the attached Figures 1 and 2. The penetrations through the floor shall be made with a concrete cutting saw or drill which will not permit contamination from the concrete floor of the underlying soils. The soil borings will be driven to the top of bedrock. For each boring, composite soil samples will be taken for each eighteen (18) inches of depth to bedrock. The samples will be stored for later analysis.

Analysis of the soil samples shall be conducted as follows:

- For each bore hole, contractor will analyze the first eighteen (18) inch (shallowest) composite soil sample for PCB and volatile organic compounds (VOC) (EPA Method-8240). PCB and VOC analysis shall be conducted on each sequentially deeper composite soil sample until one (1) ppm concentration of PCB and 10 ppb concentrations of individual VOC's are reached. Composite soil samples, taken from depths below the composite soil sample which shows concentration of PCB and VOC's at or less than the above levels, will not be analyzed.
- The composite soil sample from each building which exhibits the highest VOC concentrations shall also be subjected to a full priority pollutant scan.

1 ppm ✓

- 3 -

Task B

Contractor shall assess the levels of contamination from non-PCB contaminants (volatile organic compounds and priority pollutants) at the surface water drainage point of all surface drainage and building drains from the site. This drainage point is identified as the discharge pipe which empties into Pin Oak Creek at the southwest corner of the site.

Task C

Contractor shall assess the potential for contamination of the drinking water aquifer(s) which may be underlying the Rose Site. Contractor will include in his assessment the potential for migration of contaminants from the site via both natural and man-made pathways. In addition, the contractor shall fully identify the drinking water aquifers underlying the site, their use and quality. This Task shall be completed using existing information available to the Contractor, including DNR records of drinking water wells, City of Holden Health Department records, local drilling contractor data, U.S.G.S. data, etc. No additional monitoring wells are anticipated to be developed for this Task.

V. Schedule

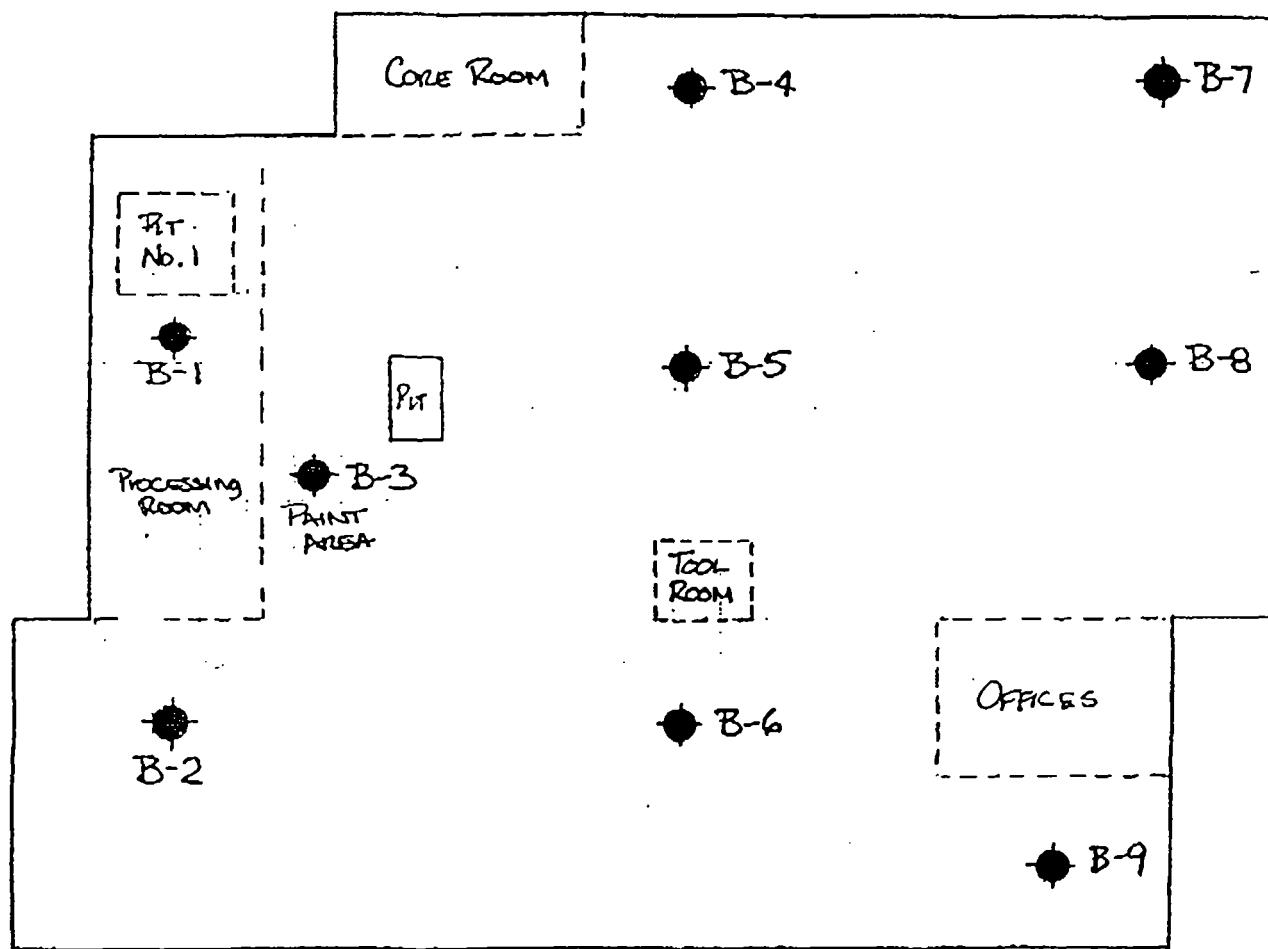
Contractor shall submit a work plan, schedule and budget cost to the Project Manager (R. Robinson) by August 17, 1987. Following authorization to proceed, contractor shall conduct the work and issue a report of findings within thirty (30) days.

IV. Work Product

Contractor shall incorporate these findings into a revised preliminary site assessment report.

M.C. Rose Chemicals Site
Preliminary Site Assessment
SUPPLEMENTAL SCOPE OF WORK

WAREHOUSE SOIL BORING LOCATIONS



KEY

B-1 - BORING LOCATION
(APPROXIMATE)

0 50'

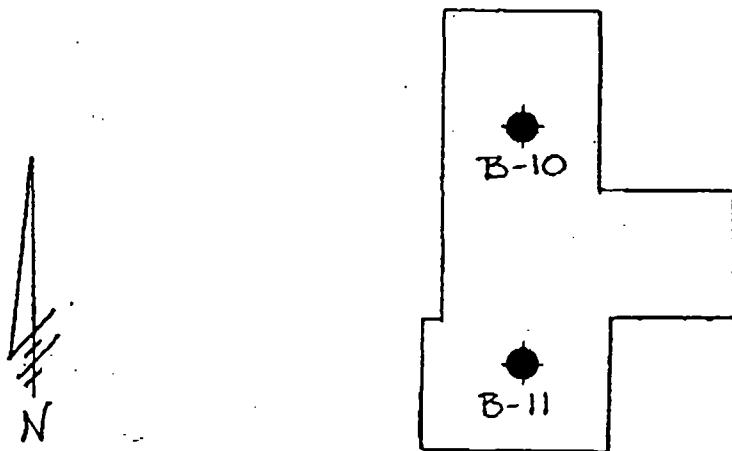
FIGURE 1

N

NORTH WAREHOUSE

M. C. ROSE CHEMICALS
PRELIMINARY SITE ASSESSMENT
SUPPLEMENTAL SCOPE OF WORK

WAREHOUSE SOIL BORING LOCATIONS



SOLITA WAREHOUSE

0 50'

FIGURE 2

KEY

- B-10 - Boring Location (Approximate)

ROSE CHEMICAL

ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

APPENDIX B

Mathes Workplan



**John Mathes
& Associates, Inc.**

210 West Sand Bank Road
P O Box 330
Columbia, IL 62236-0330
618/281-7173
314/241-1785

August 13, 1987

**W.P. Laughlin - Manager, Project Controls
Clean Sites, Inc.
1199 North Fairfax Street
Alexandria, Virginia 22314**

**Reference Workplan and Cost Estimate
Rose Chemical Preliminary Site Assessment
Contract No. CSI-SA-87.03 - Change Order No. 1**

Dear Phil:

John Mathes & Associates, Inc., (Mathes) is pleased to submit to Clean Sites, Inc. (CSI) the following brief workplan and cost estimate for the expanded scope of work requested under the above referenced contract and change order at the Rose Chemical Site in Holden, Missouri.

The scope of work was developed based on the August 6, 1987 letter from CSI to Mathes and revised during subsequent conversations between CSI and Mathes. Major tasks have been addressed separately within this workplan and cost estimate. These major tasks include: project planning and management (1.0); warehouse floor coring and soil sampling (2.0); surface soil sampling (3.0); aquifer characterization (4.0); and, data assessment and reporting (5.0).

Major Task 1.0 consists of project scope development, workplan and cost estimate preparation, and project management during field activities and site assessment.

Major Task 2.0 (Change Order No. 1, Task A) consists of mobilization and demobilization and all field activities associated with sampling the soils beneath the Main and South Warehouse floor slabs. The concrete floor slab is estimated to be six inches thick at all sampling locations and will be

AUG/87/0160i

penetrated using an electric coring machine. This task includes drilling and sampling at 11 locations, nine in the Main Warehouse and two in the South Warehouse.

The costs are estimated separately for the two warehouses in accordance with your request. Estimated costs for the work to be performed inside the warehouses assume level "B" personnel protection. If conditions allow a personnel protection downgrade, work will be performed in level "C". The need for supplied air for respiratory protection will be based on environmental air monitoring in the work space and will be dependent on the following items:

- o levels of organic vapors detected in the workspace (by HNu or OVA);
- o levels of oxygen detected in the workspace (by explosimeter). This may be affected by the operation of the drill rig engine in a closed and unvented space; and,
- o interference in the monitoring of organic vapors in the work space air caused by emissions from the drill rig engine.

The procedures to be used in the sampling and analysis of the warehouse subfloor soils are as follows:

1. The concrete floor slab will be penetrated using an electric coring machine.
2. The drilling equipment used will be a Diedrich Drilling Equipment D-25 rig. This will allow work to be performed with as little as 11 feet of overhead clearance. The rig is portable and can be transported with a fork lift rated at 2 tons. The fork lift is to be provided by CSI.
3. The borehole at each location will be advanced with 3.25-inch I.D. (7-inch O.D.) hollow-stem augers. If this procedure is not feasible, 3-inch diameter flight augers will be used.
4. Continuous sampling will be performed using 2-inch diameter split spoon samplers. In each 18-inch interval the recovered sample will be logged and scanned for volatile organic vapors. Sampling will continue to the top of bedrock (estimated to be from 12 to 15 feet deep).
5. A composite soil sample will be created from each 18-inch interval.

6. One duplicate soil sample will be collected and submitted for analysis from every borehole. Split samples will be collected, if appropriate, for submittal to the USEPA Region VII representative. The split sample will be collected from the upper 18-inch sample collected from each borehole, if possible.
7. At the completion of drilling and sampling activities, the borehole will be grouted to surface to minimize the potential for migration of contaminants.
8. To minimize the possibility of exceeding USEPA CLP designated holding times, all samples will be submitted to Langston Laboratories within 24 hours of collection. All samples will then be extracted and stored at Langston Laboratories for potential analysis.
9. The number of samples to be analyzed will be minimized by a phased approach. The number of samples analyzed initially will be dependent on indications of contamination (visual and HNu). At a minimum, analysis will be performed on the uppermost sample from each borehole. Sequentially lower samples from the same borehole will be analyzed if the level of total volatile organic compounds (VOCs) exceeds 10 ppb or if the level of PCBs exceeds 1 ppm in the uppermost sample or samples. If these levels of VOCs or PCBs are not exceeded in a sample, no additional samples from that borehole will be analyzed.
10. One sample from each warehouse, from the interval displaying the highest levels of total VOCs, will be analyzed for the full priority pollutant list of parameters.

Major Task 3.0 (Change Order No. 1, Task B) consists of those activities associated with the sampling of surficial soil at surface water discharge points from the site. From on-site observations of surface water runoff, it appears that there are four primary points of surface water discharge from the site. These are: the drain pipe (quadrant Q179) stated in the August 6, 1987 change order scope of work - Task B, page 3; the area southwest of the storm water retention ponds (quadrant Q145); the area southwest of the South Warehouse (quadrant Q004); and the area directly south of the southwest corner of the Main Warehouse (quadrant Q045). A composite sample will be

collected from the upper six inches of soil or sediment in these areas and submitted for the full priority pollutant list of parameters, excluding PCBs. One duplicate sample will be submitted from one of these areas. Split samples will be collected for submittal to the USEPA representative, if requested by CSI.

Major Task 4.0 (Change Order No. 1, Task C) consists of those activities (data acquisition, review, and reporting) associated with the identification of local aquifers and the characterization of groundwater use in the Holden, Missouri area. The sources of data will include but not be limited to: the Missouri Department of Natural Resources (Rolla, Missouri); the U.S.G.S. Water Resources Division (Rolla, Missouri); the City of Holden; and, local water well drilling contractors. Logs or records of water well completions, if available, for the Holden, Missouri vicinity will be submitted to CSI with the final report.

Major Task 5.0 consists of those efforts associated with the assessment of data accumulated during the project and preparation of the subsequent report to CSI. The final work product will consist of a draft revised Preliminary Site Assessment Report submitted in duplicate.

The total estimated cost for these five tasks is \$105,114.50. Actual costs for performing these tasks will vary depending on subsurface and site conditions. If conditions inside the warehouse allow work to be performed in level C, many of those costs associated with personnel protection in the cost estimate will be saved. All activities will be invoiced on a time and materials basis in accordance with Contract No. CSI-SA-87.03 and with the enclosed cost estimate. All analytical and sample shipping costs will be invoiced to CSI from Langston Laboratories and are not included in this cost estimate.

Our tentative mobilization date is August 24, 1987 as you requested. If you have any questions or need additional information, please do not hesitate to contact us.

Sincerely yours,

JOHN MATHES & ASSOCIATES, INC.

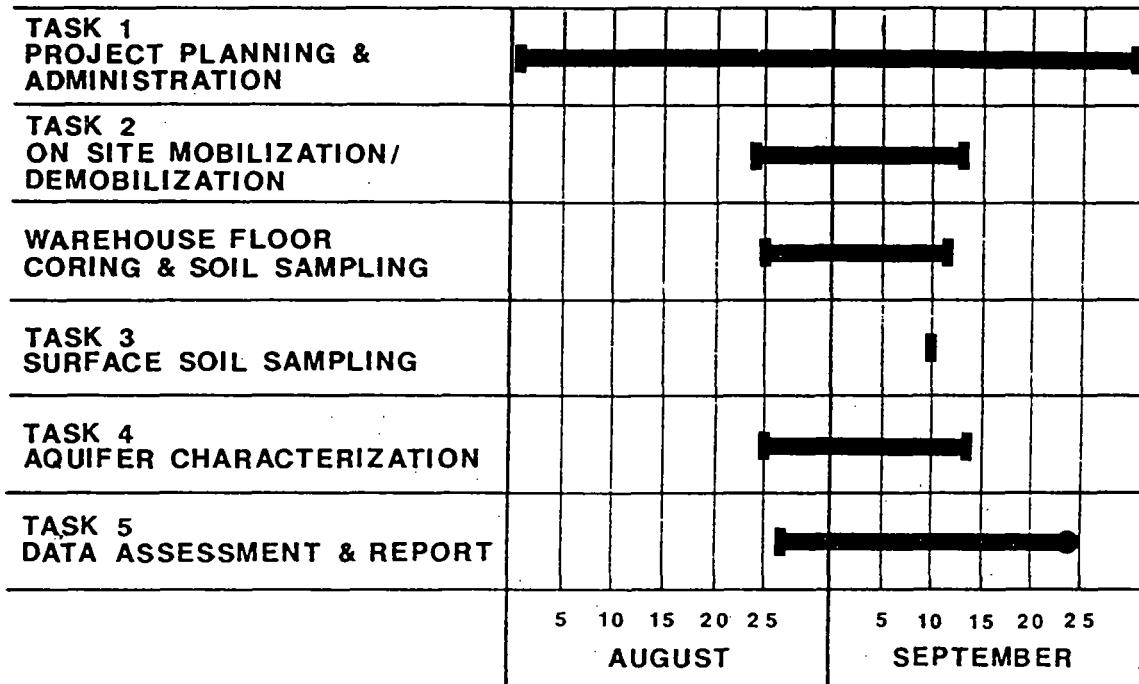


Jeffrey D. Young
Senior Hydrogeologist

Enclosures

AUG/87/0160i

**ROSE CHEMICAL FACILITY
PRELIMINARY SITE ASSESSMENT
MATHES PHASE 3 SCHEDULE**



EXPLANATION

- █ TASK BEGINNING/END
- REPORT SUBMITTAL

John Mathes & Associates, Inc.	
PROJECT SCHEDULE	
12872844	FIGURE 1

ROSE CHEMICAL

ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

APPENDIX C

Warehouse Borehole Geologic Logs

NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION

DRILLING, SAMPLING, & GROUNDWATER LEVEL SYMBOLS

AR	- Auger Refusal	3P	- Piston Sample, 3 Inches Dia.
AS	- Auger Sample	5P	- Piston Sample, 5 Inches Dia.
BS	- Bag or Bulk Sample	RB	- Rotary Rock Bit
DB	- Drag Bit	SR	- Split-Barrel Refusal
DCI	- Dry Cave-In	SS	- Standard 1½ Inches Dia. Split-Barrel Sample
DS	- Denison Sample	TOB	- Termination of Boring
FA	- Flight Auger	2T	- Thin-Walled Tube Sample, 2 Inches Dia.
HA	- Hollow-Stem Auger	3T	- Thin-Walled Tube Sample, 3 Inches Dia.
HD	- Hand Auger	TR	- Thin-Walled Tube Refusal
LS	- Large 2½ Inches Dia. Split-Barrel Sample	WB	- Wash Bore
NC	- NX Conventional Rock Core	WCI	- Wet Cave-In
NW	- NX Wireline Rock Core	WS	- Wash Sample
OS	- Osterberg Sample		
2P	- Piston Sample, 2 Inches Dia.		

DESCRIPTION ABBREVIATIONS

App	- Apparent	Med	- Medium
Bk	- Black	Mot	- Mottled
Bld	- Boulder, Boulders	Org	- Organic, Organics
Br	- Brown, Brownish	Oxi	- Oxidation, Oxidized
Calc	- Calcareous	Pkt	- Pocket, Pockets
Cbl	- Cobble, Cobbles	Pt	- Peat, Peaty
Cl	- Clay, Clayey	Rd	- Red, Reddish
Co	- Coarse	Rt	- Root, Roots
Conc	- Concretion, Concretions	Sa	- Sand, Sandy
Dk	- Dark	Sh	- Shale, Shaley
Fi	- Fine	Si	- Silt, Silty
Frac	- Fractured	Slk	- Slickenside, Slickensides
Frag	- Fragment, Fragments	Sm	- Seam, Seams
Gr	- Gray, Grayish	Sp	- Spot, Spots
Grv	- Gravel, Gravelly	Stn	- Stain, Stains
Inb	- Interbedded	Stk	- Streak, Streaks
Jt	- Joint, Joints	Tr	- Trace
Lig	- Lignite	v	- Very
Ls	- Limestone	w/	- With
Lt	- Light	Yel	- Yellow, Yellowish

NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION

APPROXIMATE PROPORTIONS		PARTICLE SIZE	
TRACE	<10%	BOULDERS	>12 Inches
WITH	10-35%	COBBLES	12 Inches - 3 Inches
MODIFIER	>35%	GRAVEL	
		Coarse	3 Inches - $\frac{3}{4}$ Inch
Clay or clayey may be used as a major material or modifier, regardless of relative proportions, if the clay content is sufficient to dominate the soil properties.		Fine	$\frac{3}{4}$ Inch - No. 4 Sieve (4.750 mm)
		SAND	
		Coarse	No. 4 - No. 10 Sieve (2.000 mm)
		Medium	No. 10 - No. 40 Sieve (0.420 mm)
		Fine	No. 40 - No. 200 Sieve (0.074 mm)
		SILT	No. 200 Sieve - 0.002 mm
		CLAY	<0.002 mm

BLOWS

Number of impacts of a 140 pound hammer falling a distance of 30 inches to cause a standard split-barrel sampler, 1½ inches I.D., to penetrate a distance of 6 inches. The number of impacts for the first 6 inches of penetration is known as the seating drive. The sum of the impacts for the last 12 inches of penetration is the Standard Penetration Test Resistance or "N" value. For example, if Blows = 6-8-9, "N" = 8+9 or 17.

OTHER NOTATION

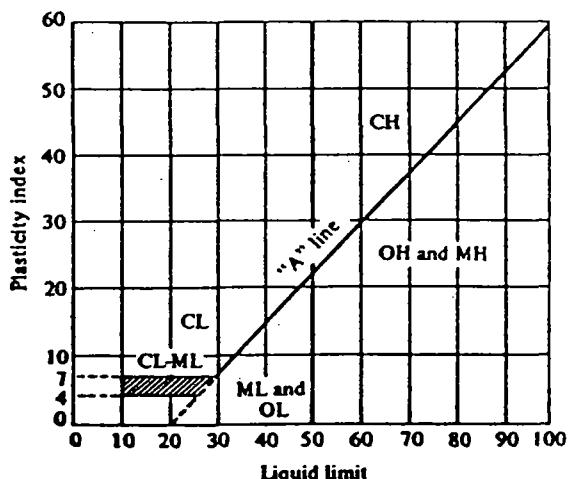
- 50/2 - Impacts to cause sampler to penetrate the indicated number of inches
- WR - Sampler penetrated under the static loading of the weight of the drill rod
- WH - Sampler penetrated under the static loading of the weight
of the hammer and drill rod
- X - No blow count
- SAA - Same as above

LABORATORY TEST SYMBOLS

D_{10}	- Effective Particle Size	PL	- Plastic Limit
k_v	- Vertical Permeability	QP	- Calibrated Penetrometer
LL	- Liquid Limit	QU	- Unconfined Compressive Strength
NMC	- Natural Moisture Content	SV	- Field Shear Vane

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria				
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	Not meeting all gradation requirements for GW			
		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines					
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols			
		GC	Clayey gravels, gravel-sand-clay mixtures					
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	SW	Well-graded sands, gravelly sands, little or no fines	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	Not meeting all gradation requirements for SW			
		SP	Poorly graded sands, gravelly sands, little or no fines					
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	SM	Silty sands, sand-silt mixtures	Atterberg limits above "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols			
		SC	Clayey sands, sand-clay mixtures					
Fine-grained soils (More than half material is smaller than No. 200 sieve)	Sils and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	<p>Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:</p> <table style="margin-left: 20px;"> <tr><td>Less than 5 per cent</td></tr> <tr><td>More than 12 per cent</td></tr> <tr><td>5 to 12 per cent</td></tr> </table> <p>Borderline cases requiring dual symbols: GW, GP, SW, SP GM, GC, SM, SC</p>	Less than 5 per cent	More than 12 per cent	5 to 12 per cent	Atterberg limits below "A" line with P.I. greater than 7
Less than 5 per cent								
More than 12 per cent								
5 to 12 per cent								
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays							
OL	Organic silts and organic silty clays of low plasticity							
Sils and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts						
	CH	Inorganic clays of high plasticity, fat clays						
	OH	Organic clays of medium to high plasticity, organic silts						
Highly organic soils	PT	Peat and other highly organic soils						



GENERAL NOTES

The number of borings is based on topographic and geologic factors; the magnitude of loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling is selected to reduce the possibility of undiscovered anomalies and increase drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as encounter of water, boulders, gas, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation in driving resistance, unusual odors, etc. However, lack of mention of such variations does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Records of Subsurface Exploration may not have stabilized, particularly in more impermeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of precipitation, infiltration, or other factors not evident at the times indicated.

Unless otherwise noted, soil classifications indicated on the Records of Subsurface Exploration are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness will be described as seams while thicker zones will be logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Records of Subsurface Exploration are approximate boundaries only as the actual material change may be between samples or may be a gradual transition. Changes in materials observed by field or laboratory personnel are indicated by solid lines whereas estimated material changes between recovered samples are indicated by dashed lines.

Samples chosen for laboratory testing are selected in such a manner so as to determine selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and only representative samples are tested, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. MWH1

DATE/TIME STARTED 8/29/87 / 0730

PROJECT NAME Rose Chemical

ELEV. _____ DRILLING METHOD _____

PROJECT NO. 12872844

MAJOR TASK 2403 SUBTASK

Hollow Stemmed Augers & Split Spoons

WELL INSTALLED: YES NO

WT SERIAL # N/A

DATE/TIME OF COMPLETIONS

BORING 8/29/87 / 0850

WELL INSTALLATION N/A

WELL PROTECTION N/A

GEOLOGIST SIGNATURE Eric J. Ahlgren

WELL PROTECTION N/A

GEOLOGIC DRILLING COMMENTS

BORING NO. MWH1 JMA PROJECT NO. 12872844 DATE 9/1/87

REMARK NO.	REMARKS
1	OVA on Sample 22.0 Needle Deflection Units (NDU).
2	OVA Over Hole 25 NDU.
3	OVA in Work Space 3 NDU.
4	OVA 40 NDU Over Augers; 25 NDU on Auger Cuttings From 3'.
5	OVA 90 NDU on Sample.
6	OVA 4 NDU Work Space.
7	OVA 500 NDU Peak; 250 NDU Constant of Sample.
8	OVA 650 NDU Peak on Sample.
9	OVA 100 NDU Peak on Sample.
10	OVA 9.5 NDU by Auger; 6.5 NDU Work Space; 150 NDU in Open Augers.
11	OVA 100 NDU Peak; 60 Constant on Sample.
12	OVA 0.0 NDU on Sample.
13	OVA 1.0 NDU on Sample.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. MWH2

DATE/TIME STARTED 8/28/87 / 0830

PROJECT NAME Rose Chemical

ELEV.	DRILLING METHOD
-------	-----------------

PROJECT NO. 12872844

~~MAJOR TASK~~ 2403 ~~SUBTASK~~ -

Hollow Stemmed Augers & Split Spoons

RIG MAKE/MODEL	DRILLER	HELPER	DEPTH	SAMPLE NO.	SAMPLE INTERVAL	SAMPLE TYPE	RECOVERY (IN)	SAMPLE RETAINED	JAR NO.	TIME	SAMPLE LABEL SERIAL #	CLASSIFICATION SYSTEM:		DEPTH OF CHANGE	QP (tsf)	N / 6"	REMARK #			
												Unified								
SAMPLE DESCRIPTION																				
Rig Model D-25 Aage	Bignall	Agne	5	1	0.5'	SS	18			0845	MWH2-1	6" Concrete Silty Clay; Brown-Red; Oxidized;		1.5	5	7	10	1		
				2	2.0'	SS					MWH2-1D	Red-Black; Damp; Fill; CL								
				3	2.0'					0900		Silty Clay; Dark Brown; Rooted; Damp; Fill; CL								
				4	3.5'	SS	14				MWH2-2	Silty Clay; Dark Brown; Visibly Cont								
				5	5.0'	SS	18			0915	MWH2-3	Moist; Fill; Bottom 3" Fill Rock; CL								
				5	5.0'	SS	12			0930	MWH2-4	Silty Clay; Dark Brown; Damp; Visibly Contaminated; Fill; CL								
				6	6.5'	SS	18			0938	MWH2-5	Top 3" Silty Clay; Dark Brown; Moist; Fill; CL								
				7	6.5'	SS	18				MWH2-6	Remainder Silty Clay; Brown-Red; Mottled; Oxidized; Fill-Mod Loess; CL								
				7	8.0'	SS	18			0945		Silty Clay; Brown-Red-Gray; Mottled; Oxidized; Damp; Fill Modified Loess; CL								
				8	9.5'	SS	18			0950	MWH2-7	Top 12" Silty Clay; Brown-Red; Oxidized; Damp; CL								
Rig Model D-25 Deitrich	Bignall	Agne	10	8	11.0'	SS	18					Bottom 6" Shale; Wthd; Red-Brown; Damp Dry		2.0	1	2	8	7		
				9	11.0'	SS	18			1000	MWH2-8	Clayey Shale; Wthd; Brown-Red; Oxidized								
				9	12.5'	SS						Bottom 3" Gray Shale; Competent								
												TOB @ 12.5'								

WELL INSTALLED: YES NO

WI SERIAL # N/A

DATE/TIME OF COMPLETIONS

BORING 8/28/87 / 1000

WELL INSTALLATION N/A

WELL PROTECTION N/A

GEOLOGIST SIGNATURE

Eric J. Ahlgren

GEOLOGIC DRILLING COMMENTS

BORING NO. MWH2 JMA PROJECT NO. 12872844 DATE 8/28/87

REMARK NO.	REMARKS
1	OVA 10 Needle Deflection Units (NDU).
2	OVA 60 NDU on Sample.
3	OVA 70 NDU on Sample.
4	OVA 40 NDU on Sample.
5	OVA Poor Recovery Due to Fill Rock Blocking a Portion of the Shoe.
6	OVA 25 NDU on Sample.
7	OVA 15 NDU on Sample.
8	OVA 0.0 NDU on Sample.
9	OVA 3.0 NDU on Sample.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. MWH3

DATE/TIME STARTED 8/30/87 / 1330

PROJECT NO. 12872844

PROJECT NAME Rose Chemical

MAJOR TASK 2403 SUBTASK -

ELEV. DRILLING METHOD

Hollow Stemmed Augers & Split Spoons

DRILLER	HELPER	DEPTH	SAMPLE NO.	SAMPLE INTERVAL	SAMPLE TYPE	RECOVERY (IN)	SAMPLE RETAINED	JAR NO.	TIME	SAMPLE LABEL SERIAL #	CLASSIFICATION SYSTEM:	DEPTH OF CHANGE	QP (tsf)	REMARK #
											Unified			
Agne														
Bignal														
5			1	0.5'	SS	18			1340	MWH3-1 MWH3-1D	6" Concrete Fill Zone; Silty Clay; Black; Visibly Contaminated; Damp-Wet; Fill; CL			
			2	2.0'	SS	16			1350	MWH3-2	Silty Clay; Black-Dark-Brown; Visibly Contaminated; Damp; Fill; CL			
			3	2.0'							Silty Clay; Brown-Gray; Damp; Fill;			
			4	3.5'	SS	18			0655	MWH3-3	Modified Loess; CL			
			5	5.0'							Silty Clay; Red-Brown-Gray; Mottled; Oxidized; Damp; Fill-Modified Loess; CL	3	5	10 4,5,6
				6.5'	SS	18			0705	MWH3-4	Silty Clay; Red-Brown-Gray; Mottled;			
			6	6.5'							Oxidized; Damp; Fill; Mod Loess; CL	4	9	8 7,8
			7	8.0'	SS	12			0720	MWH3-5	Silty Clay; Brown-Red; Oxidized; w/Wthd Shale @ Bottom of Sample; Damp; CL			
			8	9.5'	SS	18			0730	MWH3-6	Clayey Shale; Wthd; Brown-Red-Gray;	3	10	10 11
			9	11.0'	SS	18			0740	MWH3-7	Remnant Fissility; Shale			
											TOB @ 11.0'			
RIG MAKE/MODEL	Deitrich D-25	15												
		20												
		25												

WELL INSTALLED: YES NO X

DATE/TIME OF COMPLETIONS

WI SERIAL # N/ABORING 8/31/87 / 0750GEOLOGIST SIGNATURE Eric J. AhlgrenWELL INSTALLATION N/AWELL PROTECTION N/A

GEOLOGIC DRILLING COMMENTS

BORING NO. MWH3 JMA PROJECT NO. 12872844 DATE 8/30-31/87

REMARK NO.	REMARKS
1	Pushed Spoon 12"
2	OVA 20 Needle Deflection Units (NDU) On Sample.
3	OVA 90 NDU On Sample; OVA 5 NDU In Work Area.
4	Monday 8/31/87, 0630.
5	OVA 15 NDU Over Augers.
6	OVA 65 NDU Peak; 40 NDU Constant On Sample,
7	OVA 9.5 NDU In Work Area.
8	OVA 15 NDU On Sample.
9	Pushed Sample.
10	OVA 90 NDU Peak; 40 NDU Constant On Sample; 9.5 NDU In Work Area.
11	OVA 1 NDU On Sample; 8.5 NDU In Work Area.
12	OVA 0.0 NDU On Sample; 80-90 NDU Over Augers.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. MWH4

DATE/TIME STARTED 8/27/87 / 0815

PROJECT NAME Rose Chemical

ELEV. DRILLING METHOD

PROJECT NO. 12872844

MAJOR TASK 2403 SUBTASK -

Hollow Stemmed Augers & Split Spoons

RIG MAKE/MODEL Agne	DRILLER Bignal	DEPTH ft	SAMPLE NO.	SAMPLE INTERVAL	SAMPLE TYPE	RECOVERY (in)	SAMPLE RETAINED	TIME	SAMPLE LABEL SERIAL #	CLASSIFICATION SYSTEM:		DEPTH OF CHANGE	QP (tsf)	N/6"	REMARK #
										Unified					
		1	0.5'		SS	6		0830	MWH4-1	6" Concrete					
		2	2.0'						MWH4-1D	Brown Silt & Fill Rock; Fill		11	4	5	1
		3	2.0'		SS	14		0845	MWH4-2	Silty Clay; Brown-Red-Gray Mottled; Damp; Modified Loess; CL		1.5	2	4	6
		4	3.5'					0900	MWH4-3	Silty Clay; Brown-Gray; Mottled; Damp; Oxidized; Modified Loess; CL		2.5	5	9	13
		5	5.0'		SS	18		0915	MWH4-4	Silty Clay; Brown-Red-Gray; Mottled; Oxidized; Damp; Modified Loess; CL		2.5	3	4	7
		6	6.5'					0930	MWH4-5	Silty Clay; Brown-Red-Gray; Mottled		2.5	3	4	7
		7	8.0'		SS	18		0945	MWH4-6	Damp; Oxidized; Black Streaks; CL-CH		3.0	7	10	12
		8	9.5'						MWH4-7	Silty Clay; Brown-Red-Gray; Mottled; Oxidized; Red-Black; Mod Loess; CL		2.5	7	4	5
		9	11.0'		SS	18		1000		Silty Clay; Brown-Gray; Mottled; Damp; Modified Loess; CL-CH; Wthd			3	6	14
		10	11.0'						MWH4-8	Shale; Shale; Gray-Red-Brown; Wthd Remnant Fissility; Dry			8	11	19
		11	12.5'		SS	18		1015		TOB @ 12.5'					
		12													
		13													
		14													
		15													
		16													
		17													
		18													
		19													
		20													
		21													
		22													
		23													
		24													
		25													

WELL INSTALLED: YES NO X

WI SERIAL # N/A

GEOLOGIST SIGNATURE Eric J. Ahlgren

DATE/TIME OF COMPLETIONS

BORING 8/27/87 / 1015

WELL INSTALLATION N/A

WELL PROTECTION N/A

BORING NO. MWH4 JMA PROJECT NO. 12872844 DATE 8/27/87

REMARK NO.	REMARKS
1	OVA 1.5 Needle Deflection Units (NDU) on Sample.
2	OVA 8-10 NDU on Sample.
3	OVA 8-10 NDU on Sample.
4	OVA 4 NDU on Sample.
5	OVA 2 NDU on Sample.
6	OVA 0.0 NDU on Sample.
7	Higher Clay Content.
8	OVA 0.0 NDU on Sample.
9	OVA 0.0 NDU on Sample.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. MWH5

DATE/TIME STARTED 8/27/87 / 1400

PROJECT NAME Rose Chemical

PROJECT NO. 12872844

MAJOR TASK 2403 **SUBTASK** -

Hollow Stemmed Augers & Split Spoons

WELL INSTALLED: YES NO

WI SERIAL # N/A

DATE/TIME OF COMPLETIONS

BORING 8/27/87 / 1545

WELL INSTALLATION N/A

WELL PROTECTION N/A

GEOLOGIST SIGNATURE Eric J. Ahlgren

GEOLOGIC DRILLING COMMENTS

BORING NO. MWHS JMA PROJECT NO. 12872844 DATE 8/27/87

REMARK NO.	REMARKS
1	OVA 30 Needle Deflection Units (NDU) On Sample.
2	OVA 55 NDU On Sample.
3	OVA 10 NDU On Sample.
4	OVA 9 NDU On Sample.
5	OVA 10-12 NDU On Sample.
6	OVA 7-9 NDU On Sample.
7	Black Coal-Like Zone In Clay Matrix Approximately 9-9.5'.
8	OVA 0.0 On Sample.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. MWH6

DATE/TIME STARTED 8/29/87

PROJECT NAME Rose Chemical

ELEV. DRILLING METHOD

PROJECT NO. 12872844

MAJOR TASK 2403 SUBTASK -

Hollow Stemmed Augers & Split Spoons

RIG MAKER/MODEL DRILLER	DEPTH ft	HELPER	SAMPLE NO.	SAMPLE INTERVAL	SAMPLE TYPE	RECOVERY (in)	SAMPLE RETAINED	JAR NO.	TIME	SAMPLE LABEL SERIAL #	CLASSIFICATION SYSTEM:		DEPTH OF CHANGE	QP (tsf)	N/6"	REMARK #
											Unified					
Bignell	0.5'	Agne	1	0.5'	SS	18			1245	MWH6-1	6" Concrete 3" Fill Rock; Si Clay; Bl-Dk Brown					
	2.0'		2	2.0'	SS	12				MWH6-1D	5-2' Damp; Fill ; CL			5	8	9
	3.5'		3	3.5'	SS	18			1250	MWH6-2	Si Clay; Bl-Dk Brown; Damp Visibly contaminated; FILL CL		1.0	3	5	8
	5.0'		4	3.5'	SS	18			1305	MWH6-3	Top 3" Si Clay; Bl-Dk-Brown; visibly contaminated; CL		2.5	4	10	17
	5.0'		5	5.0'	SS	18			1310	MWH6-4	Below Silty Clay; Br-Red-Gray; Mottled; Damp; CL		2.5	4	7	9
	6.5'		6	6.5'	SS	18			1330	MWH6-5	Si-Clay; Br-Red Gray; Mottled; Damp; Oxidized Fill-Mod Loess : CL		2.0	3	6	10
	8.0'		7	8.0'	SS	14			1350	MWH6-6	Si Clay; Br-Red; Trace Weathered		4	10	12	10
	9.5'		8	9.5'	SS	18			1405	MWH6-7	Shale; Damp; Fill-Mod Loess : CL					11
	11.0'										Si-Clay; Br-Red; W/Weathered Shale; CLOH					12
	15										Clayey Shale; Damp-Dry, Weathered					9
	20										Red-Br-Gr; Remnant Fissility;					13
	25										Damp; Dry					
											T.O.B. 11.0'					

WELL INSTALLED: YES NO

WI SERIAL # N/A

GEOLOGIST SIGNATURE Eric J. Ahlgren

DATE/TIME OF COMPLETIONS

BORING

WELL INSTALLATION N/A

WELL PROTECTION N/A

ANSWER: **1. The following are the main features of the new system:**

BORING NO. MWH6 JMA PROJECT NO. 12872844 DATE 8/29/87

BORING NO. MWH6 JMA PROJECT NO. 12872844 DATE 8/29/87

REMARK NO.	REMARKS
1	OVA 100 Needle Deflection Units (NDU) On Sample.
2	OVA 50 NDU On Sample.
3	OVA 5 NDU In Work Area.
4	OVA 80 NDU In Augers.
5	OVA 80 NDU On Sample.
6	OVA 100 NDU Over Augers.
7	OVA 30 NDU On Sample.
8	OVA 5 NDU In Work Area.
9	OVA 10 NDU On Sample.
10	OVA .5 NDU On Sample.
11	OVA 0.0 NDU On Sample.
12	Carbon Monoxide Tube (Draeger) Used; Only Minimal Response (2-3 ppm)
13	OVA 8 NDU In Work Area.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A
PAGE 1 OF 1

BOREHOLE NO. MWH7

DATE/TIME STARTED 8/30/87 / 0845

PROJECT NAME Rose Chemical

ELEV. _____ **DRILLING METHOD**

PROJECT NO. 12872844

MAJOR TASK 2403 **SUBTASK**

Hollow Stemmed Augers & Split Spoons

WELL INSTALLED: YES NO X

WI. SERIAL # N/A

GEOLOGIST SIGNATURE Eric J. Ahlgren

DATE/TIME OF COMPLETIONS

BORING 8/30/87 / 0950

WELL INSTALLATION N/A

WELL PROTECTION

BORING NO. MWH7 JMA PROJECT NO. 12872844 DATE 8/30/87

REMARK NO.	REMARKS
1	OVA on Sample 0.0 Needle Deflection Units (NDU)
2	OVA on Sample 1.0 NDU
3	OVA on Sample 0.0 NDU
4	OVA on Sample 0.0 NDU
5	OVA on Sample .2 NDU
6	OVA on Sample 0.0 NDU
7	OVA on Sample 0.0 NDU

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A
PAGE 1 OF 1

BOREHOLE NO. MWH8

DATE/TIME STARTED 8/25/87 1100

PROJECT NAME Rose Chemical

ELEV. _____ DRILLING METHOD

PROJECT NO. 12872844

MAJOR TASK 2403 SUBTASK -

Hollow Stemmed Augers & Split Spoons

WELL INSTALLED: YES NO

WT SERIAL # - N/A

DATE/TIME OF COMPLETIONS

BORING 8/25/87 1700

WELL INSTALLATION N/A

GEOLOGIST SIGNATURE Eric J. Ahlgren

BORING NO. MWH8 JMA PROJECT NO. 12872844 DATE 8/25/87

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A
PAGE 1 OF 1

BOREHOLE NO. MWH9

DATE/TIME STARTED 8/26/87 0945

PROJECT NAME Rose Chemical

ELEV. _____ DRILLING METHOD

PROJECT NO. 12872844

MAJOR TASK 2403 **SUBTASK** —

Hollow Stemmed Augers & Split Spoons

WELL INSTALLED: YES NO

WI SERIAL # N/A

DATE/TIME OF COMPLETIONS

BORING 8/26/87 1230

Eric J. Ahlesen

WELL INSTALLATION N/A

WELL PROTECTION N/A

GEOLOGIC DRILLING COMMENTS

BORING NO. MWH9

JMA PROJECT NO. 12872844

DATE 8/26/87

REMARK NO.	REMARKS
1	3" Spoon on First Sample.
2	OVA 300 Needle Deflection Unit (NDU) Over Hole.
3	OVA 3 NDU In Work Area.
4	OVA 30 NDU On Samples # 1 and #2.
5	OVA NDU On Sample # 3; 3 NDU In Work Area.
6	OVA 10 NDU On Sample # 4.
7	OVA 10 NDU On Sample # 5.
8	OVA 2 NDU On Sample # 6.
9	OVA 7 NDU On Sample # 7.
10	Bottom 3" Of Sample Soft Gray Clay.
11	OVA 2 NDU On Sample # 8.
12	OVA .5 NDU On Sample # 9.

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A
PAGE 1 OF 1

BOREHOLE NO. SWH10

DATE/TIME STARTED 9/1/87 / 0800

PROJECT NAME Rose Chemical

DRILLING METHOD

PROJECT NO. 12872844

MAJOR TASK 2403 **SUBTASK**

Hollow Stemmed Augers & Split Spoons

WELL INSTALLED: YES NO

WI SERIAL # N/A

DATE/TIME OF COMPLETIONS

BORING 9/1/87 / 0840

WELL INSTALLATION N/A

WELL PROTECTION

BORING NO. SWH10 **JMA PROJECT NO.** 12872844 **DATE** 9/1/87

WATER LEVELS



GEOLOGIC LOG

SERIAL NO. GL N/A

PAGE 1 OF 1

BOREHOLE NO. SWH11

DATE/TIME STARTED 8/31/87 / 1315

PROJECT NAME Rose Chemical

ELEV.

DRILLING METHOD

PROJECT NO. 12872844

MAJOR TASK 2403 SUBTASK -

Hollow Stem Augers and Split Spoons

DRILLER J. BIGNALL CME-55	DEPTH	SAMPLE NO.	SAMPLE INTERVAL	SAMPLE TYPE	RECOVERY	JAR NO.	TIME	SAMPLE RETAINED	SAMPLE LABEL SERIAL #	CLASSIFICATION SYSTEM:		DEPTH OF CHANGE	QP (tsf)	N/6"	REMARK #
										Unified					
	1								SWH11-1	SAMPLE DESCRIPTION		1.0	4 6 7 1,2,	N/6"	
	2	0.5	SS	18			1330		SWH11-1D						
	3	2'	SS	18			1340		SWH11-2						
	4	3.5'	SS	6			1350		SWH11-3						
	5									6" Concrete Silty Clay; Brown-Red-Green; Mottled; Visibly Contaminated; Damp; Fill; CL Silty Clay; Dark Brown-Green; Visibly Contaminated; Damp; Full Mod Loess; CL Limestone Frags in Bottom Of Shoe Auger And Split Spoon Refusal at 4'					
	10									T.O.B. 4.0'					
	15														
	20														
	25														

WELL INSTALLED: YES NO XWI SERIAL # N/AGEOLOGIST SIGNATURE Eric J. Algren

DATE/TIME OF COMPLETIONS

BORING 8/31/87 / 1400

WELL INSTALLATION N/AWELL PROTECTION N/A

GEOLOGIC DRILLING COMMENTS

BORING NO. SWH11 **JMA PROJECT NO.** 12872844 **DATE** 8/31/87

REMARK NO.	REMARKS
1	OVA 2 Needle Deflection Units (NDU) Above Background Before Beginning To Drill.
2	OVA 300 NDU Over Open Hole; 10 NDU In Work Area.
3	OVA 320 NDU on Sample.
4	OVA 150 NDU Over Augers; 10 NDU In Work Area.
5	OVA 85 NDU On Sample.
6	50 Blows Spoon Refusal; Auger Refusal.
7	Limestone Fragments In Shoe; Appears To Be Fresh Limestone.
8	OVA 50 NDU On Sample.

WATER LEVELS

ROSE CHEMICAL

ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

APPENDIX D

Soil Sample Analytical Data - Warehouses

Note: Main Warehouse samples are identified as NWH-# in the Langston Laboratory results. The identification prefix NWH is incorrect and should be MWH as used in the report. The location numbers, which follow the prefix NWH in the analytical results, correctly correspond to those in the report.



LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 29, 1987
P. O. Box 330 COMPLETED: September 2, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3516
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-1-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-1-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls Aroclor 1260	0.3 mg/kg



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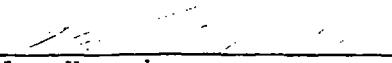
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 29, 1987
P. O. Box 330 COMPLETED: September 2, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3516
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NHW-1-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NHW-1-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 29, 1987
P. O. Box 330 COMPLETED: September 2, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3516
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-1-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

[Signature]
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-1-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-2-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-2-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-2-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-2-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

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P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-2-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-2-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 31, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 4, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3525
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-3-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-3-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	0.23 mg/kg
	Aroclor 1260	0.41 mg/kg



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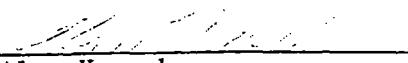
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 31, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 4, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3525
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-3-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-3-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	0.27 mg/kg
	Aroclor 1260	0.28 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 31, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 4, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3525
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-3-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-3-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 27, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 1, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3487
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

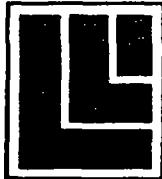
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-4-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-4-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls Aroclor 1260	0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 27, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 1, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3487
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-4-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-4-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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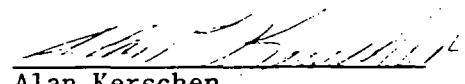
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 27, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 1, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3487
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-4-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-4-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls Aroclor 1242	0.4 mg/kg



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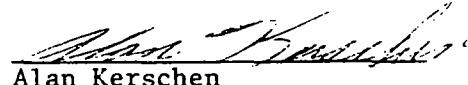
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

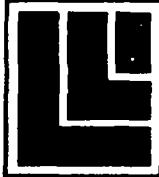
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	7.9 mg/kg
	Aroclor 1260	107 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	2.0 mg/kg
	Aroclor 1260	23 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	9.0 mg/kg
	Aroclor 1260	100 mg/kg



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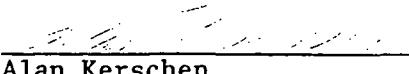
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 16, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3658
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3507)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-2 2'-3.5'	Antimony	4.6 mg/kg
	Arsenic	< 2.0 mg/kg
	Beryllium	0.65 mg/kg
	Cadmium	2.8 mg/kg
	Chromium	12.7 mg/kg
	Copper	13.5 mg/kg
	Lead	< 1.0 mg/kg
	Mercury	< 0.1 mg/kg
	Nickel	15.8 mg/kg
	Selenium	< 2.0 mg/kg
	Silver	0.31 mg/kg
	Thallium	2.8 mg/kg
	Zinc	29.4 mg/kg
	Cyanide	0.01 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3507)

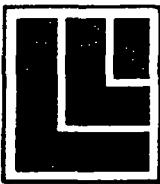
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-2 2'-3.5'	Phenol	< 330 µg/kg
	bis(2-Chloroethyl)ether	< 330 µg/kg
	2-Chlorophenol	< 330 µg/kg
	1,3-Dichlorobenzene	< 330 µg/kg
	1,4-Dichlorobenzene	< 330 µg/kg
	Benzyl Alcohol	< 330 µg/kg
	1,2-Dichlorobenzene	< 330 µg/kg
	2-Methylphenol	< 330 µg/kg
	bis(2-Chloroisopropyl)ether	< 330 µg/kg
	4-Methylphenol	< 330 µg/kg
	n-Nitroso-di-n-propylamine	< 330 µg/kg
	Hexachloroethane	< 330 µg/kg
	Nitrobenzene	< 330 µg/kg
	Isophorone	< 330 µg/kg
	2-Nitrophenol	< 330 µg/kg
	2,4-Dimethylphenol	< 330 µg/kg
	Benzoic Acid	< 1,600 µg/kg
	bis(2-Chloroethoxy)methane	< 330 µg/kg
	2,4-Dichlorophenol	< 330 µg/kg
	1,2,4-Trichlorobenzene	48,000 µg/kg
	Naphthalene	< 330 µg/kg
	4-Chloroaniline	< 330 µg/kg
	Hexachlorobutadiene	< 330 µg/kg
	4-Chloro-3-methylphenol	< 330 µg/kg
	2-Methylnaphthalene	< 330 µg/kg
	Hexachlorocyclopentadiene	< 330 µg/kg
	2,4,6-Trichlorophenol	< 330 µg/kg
	2,4,5-Trichlorophenol	< 1,600 µg/kg
	2-Chloronaphthalene	< 330 µg/kg
	2-Nitroaniline	< 1,600 µg/kg
	Dimethylphthalate	< 330 µg/kg
	Acenaphthylene	< 330 µg/kg
	2,6-Dinitrotoluene	< 330 µg/kg

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3507)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-2 2'-3.5'	3-Nitroaniline	< 1,600 µg/kg
	Acenaphthene	< 330 µg/kg
	2,4-Dinitrophenol	< 1,600 µg/kg
	4-Nitrophenol	< 1,600 µg/kg
	Dibenzofuran	< 330 µg/kg
	2,4-Dinitrotoluene	< 330 µg/kg
	Diethylphthalate	< 330 µg/kg
	4-Chlorophenol-phenylether	< 330 µg/kg
	Fluorene	< 330 µg/kg
	4-Nitroaniline	< 1,600 µg/kg
	4,6-Dinitro-2-methylphenol	< 1,600 µg/kg
	N-Nitrosodiphenylamine	< 330 µg/kg
	4-Bromophenyl-phenylether	< 330 µg/kg
	Hexachlorobenzene	< 330 µg/kg
	Pentachlorophenol	< 1,600 µg/kg
	Phenanthrene	< 330 µg/kg
	Anthracene	< 330 µg/kg
	Di-n-butylphthalate	< 330 µg/kg
	Fluoranthene	< 330 µg/kg
	Pyrene	< 330 µg/kg
	Butylbenzylphthalate	< 330 µg/kg
	3,3'-Dichlorobenzidine	< 660 µg/kg
	Benzo(a)anthracene	< 330 µg/kg
	Chrysene	< 330 µg/kg
	bis(2-Ethylhexyl)phthalate	< 330 µg/kg
	Di-n-octylphthalate	< 330 µg/kg
	Benzo(b)fluoranthene	< 330 µg/kg
	Benzo(k)fluoranthene	< 330 µg/kg
	Benzo(a)pyrene	< 330 µg/kg
	Indeno(1,2,3-cd)pyrene	< 330 µg/kg
	Dibenz(a,h)anthracene	< 330 µg/kg
	Benzo(g,h,i)perylene	< 330 µg/kg

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3507)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-2 2'-3.5'	Pesticides	
	Aldrin	< 10 mg/kg
	Alpha-BHC	< 10 mg/kg
	Beta-BHC	< 10 mg/kg
	Gamma-BHC	< 10 mg/kg
	Delta-BHC	< 10 mg/kg
	Chlordane	< 10 mg/kg
	4,4'-DDT	< 10 mg/kg
	4,4'-DDE	< 10 mg/kg
	4,4'-DDD	< 10 mg/kg
	Dieldrin	< 10 mg/kg
	Alpha-Endosulfan	< 10 mg/kg
	Beta-Endosulfan	< 10 mg/kg
	Endosulfan Sulfate	< 10 mg/kg
	Endrin	< 10 mg/kg
	Endrin Aldehyde	< 10 mg/kg
	Heptachlor	< 10 mg/kg
	Heptachlor Epoxide	< 10 mg/kg
	Toxaphene	< 10 mg/kg
	Methoxychlor	< 10 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 14, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 27, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-5-3 3.5'-5'	Polychlorinated Biphenyls Aroclor 1260	0.80 mg/kg

APPROVED:

Alan Kerschen
Vice President



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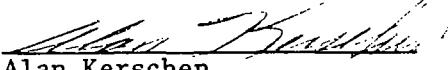
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 30, 1987
P. O. Box 330 COMPLETED: September 3, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3517
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-6-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-6-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	1.2 mg/kg
	Aroclor 1260	1.2 mg/kg



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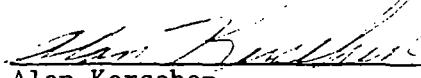
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 30, 1987
P. O. Box 330 COMPLETED: September 3, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3517
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-6-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-6-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 30, 1987
P. O. Box 330 COMPLETED: September 3, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3517
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-6-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 29, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-6-1 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	0.59 mg/kg
	Aroclor 1260	0.50 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 30, 1987
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3518
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-7-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-7-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 30, 1987
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3518
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-7-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

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Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-7-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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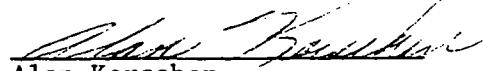
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 30, 1987
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3518
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-7-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 30, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-7-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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LABORATORY REPORT

CLIENT:	John Mathes & Associates, Inc. P. O. Box 330 Columbia, IL 62236-0330	RECEIVED:	August 26, 1987 (3:00 pm)
		COMPLETED:	August 31, 1987
ATTN:	Jeffrey D. Young	LLI NO.:	87-3469
		PROJECT NO.:	12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 25, 1987 by Thomas E. Fuhrhop

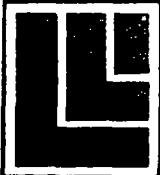
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-8-1		
	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 25, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-8-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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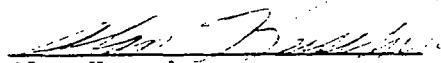
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 26, 1987 (3:00 pm)
P. O. Box 330 COMPLETED: August 31, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3469
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 25, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-8-1-D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 25, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-8-1-D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 26, 1987 (3:00 pm)
P. O. Box 330 COMPLETED: August 31, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3469
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 25, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-8-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 25, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-8-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls Aroclor 1260	0.3 mg/kg



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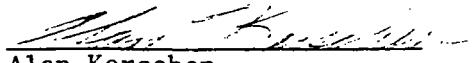
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 27, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 1, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3487
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 26, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-9~1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 26, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-9-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 27, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 1, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3487
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 26, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-9-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 26, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-9-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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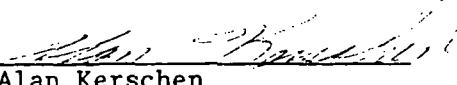
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 27, 1987 (1:00 pm)
P. O. Box 330 COMPLETED: September 1, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3487
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 26, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-9-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 26, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
NWH-9-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: I2872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

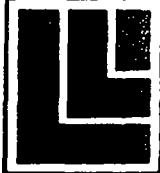
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-10-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-10-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
Polychlorinated Biphenyls		
	Aroclor 1242	1.7 mg/kg
	Aroclor 1260	8.8 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-10-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-10-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
Polychlorinated Biphenyls		
	Aroclor 1242	1.9 mg/kg
	Aroclor 1260	5.0 mg/kg



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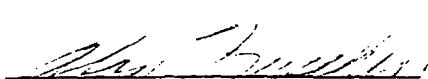
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-10-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

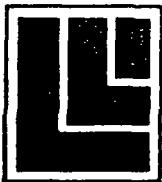
APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-10-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-1 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

A handwritten signature in black ink, appearing to read "Alan Kerschen".
Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-1 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-1-D 0.5'-2'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-1-D 0.5'-2'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



LANGSTON LABORATORIES, INC.

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

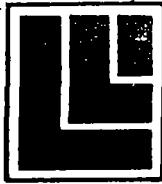
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-2 2'-3.5'	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-2 2'-3.5'	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
Polychlorinated Biphenyls		
	Aroclor 1242	9.5 mg/kg
	Aroclor 1260	6.0 mg/kg



LANGSTON LABORATORIES, INC.

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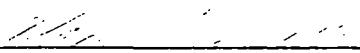
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 16, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3658
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3556)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-2 2'-3.5'	Antimony	2.5 mg/kg
	Arsenic	< 2.0 mg/kg
	Beryllium	0.82 mg/kg
	Cadmium	3.9 mg/kg
	Chromium	20.0 mg/kg
	Copper	20.5 mg/kg
	Lead	< 1.0 mg/kg
	Mercury	< 0.1 mg/kg
	Nickel	27.3 mg/kg
	Selenium	< 2.0 mg/kg
	Silver	0.19 mg/kg
	Thallium	3.1 mg/kg
	Zinc	63.4 mg/kg
	Cyanide	0.04 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3556)

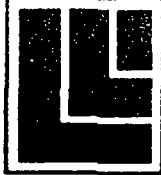
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-2 2'-3.5'	Phenol	< 330 µg/kg
	bis(2-Chloroethyl)ether	< 330 µg/kg
	2-Chlorophenol	< 330 µg/kg
	1,3-Dichlorobenzene	< 330 µg/kg
	1,4-Dichlorobenzene	< 330 µg/kg
	Benzyl Alcohol	< 330 µg/kg
	1,2-Dichlorobenzene	< 330 µg/kg
	2-Methylphenol	< 330 µg/kg
	bis(2-Chloroisopropyl)ether	< 330 µg/kg
	4-Methylphenol	< 330 µg/kg
	n-Nitroso-di-n-propylamine	< 330 µg/kg
	Hexachloroethane	< 330 µg/kg
	Nitrobenzene	< 330 µg/kg
	Isophorone	< 330 µg/kg
	2-Nitrophenol	< 330 µg/kg
	2,4-Dimethylphenol	< 330 µg/kg
	Benzoic Acid	< 1,600 µg/kg
	bis(2-Chloroethoxy)methane	< 330 µg/kg
	2,4-Dichlorophenol	< 330 µg/kg
	1,2,4-Trichlorobenzene	< 330 µg/kg
	Naphthalene	< 330 µg/kg
	4-Chloroaniline	< 330 µg/kg
	Hexachlorobutadiene	< 330 µg/kg
	4-Chloro-3-methylphenol	< 330 µg/kg
	2-Methylnaphthalene	< 330 µg/kg
	Hexachlorocyclopentadiene	< 330 µg/kg
	2,4,6-Trichlorophenol	< 330 µg/kg
	2,4,5-Trichlorophenol	< 1,600 µg/kg
	2-Chloronaphthalene	< 330 µg/kg
	2-Nitroaniline	< 1,600 µg/kg
	Dimethylphthalate	< 330 µg/kg
	Acenaphthylene	< 330 µg/kg
	2,6-Dinitrotoluene	< 330 µg/kg

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3556)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-2 2'-3.5'	3-Nitroaniline	< 1,600 µg/kg
	Acenaphthene	< 330 µg/kg
	2,4-Dinitrophenol	< 1,600 µg/kg
	4-Nitrophenol	< 1,600 µg/kg
	Dibenzofuran	< 330 µg/kg
	2,4-Dinitrotoluene	< 330 µg/kg
	Diethylphthalate	< 330 µg/kg
	4-Chlorophenol-phenylether	< 330 µg/kg
	Fluorene	< 330 µg/kg
	4-Nitroaniline	< 1,600 µg/kg
	4,6-Dinitro-2-methylphenol	< 1,600 µg/kg
	N-Nitrosodiphenylamine	< 330 µg/kg
	4-Bromophenyl-phenylether	< 330 µg/kg
	Hexachlorobenzene	< 330 µg/kg
	Pentachlorophenol	< 1,600 µg/kg
	Phenanthrene	< 330 µg/kg
	Anthracene	< 330 µg/kg
	Di-n-butylphthalate	< 330 µg/kg
	Fluoranthene	< 330 µg/kg
	Pyrene	< 330 µg/kg
	Butylbenzylphthalate	< 330 µg/kg
	3,3'-Dichlorobenzidine	< 660 µg/kg
	Benzo(a)anthracene	< 330 µg/kg
	Chrysene	< 330 µg/kg
	bis(2-Ethylhexyl)phthalate	< 330 µg/kg
	Di-n-octylphthalate	< 330 µg/kg
	Benzo(b)fluoranthene	< 330 µg/kg
	Benzo(k)fluoranthene	< 330 µg/kg
	Benzo(a)pyrene	< 330 µg/kg
	Indeno(1,2,3-cd)pyrene	< 330 µg/kg
	Dibenz(a,h)anthracene	< 330 µg/kg
	Benzo(g,h,i)perylene	< 330 µg/kg

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3556)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-2 2'-3.5'	Pesticides	
	Aldrin	< 1 mg/kg
	Alpha-BHC	< 1 mg/kg
	Beta-BHC	< 1 mg/kg
	Gamma-BHC	< 1 mg/kg
	Delta-BHC	< 1 mg/kg
	Chlordane	< 1 mg/kg
	4,4'-DDT	< 1 mg/kg
	4,4'-DDE	< 1 mg/kg
	4,4'-DDD	< 1 mg/kg
	Dieldrin	< 1 mg/kg
	Alpha-Endosulfan	< 1 mg/kg
	Beta-Endosulfan	< 1 mg/kg
	Endosulfan Sulfate	< 1 mg/kg
	Endrin	< 1 mg/kg
	Endrin Aldehyde	< 1 mg/kg
	Heptachlor	< 1 mg/kg
	Heptachlor Epoxide	< 1 mg/kg
	Toxaphene	< 1 mg/kg
	Methoxychlor	< 1 mg/kg



LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 14, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3556
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Sample Collected from Rose Chemical, Holden, MO
on August 31, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
SWH-11-3 3.5'-4'	Polychlorinated Biphenyls	< 0.2 mg/kg

APPROVED:

A handwritten signature in black ink, appearing to read "Alan Kerschen".
Alan Kerschen
Vice President

ROSE CHEMICAL

ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

APPENDIX E

Soil Sample Analytical Data - Surface Soils



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3557
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
4 SS #1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
4 SS #1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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LABORATORY REPORT

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P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3557
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
3 SS #2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
3 SS #2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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LABORATORY REPORT

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P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3557
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
2 SS #3	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
2 SS #3	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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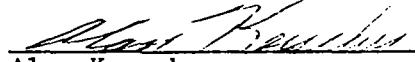
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3557
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
1 SS #4	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

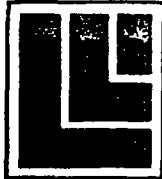
SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

SAMPLE
IDENTIFICATION

1 SS #4

ANALYSIS

	<u>RESULTS</u>
Benzene	< 0.50 mg/kg
trans-1,3-Dichloropropene	< 0.50 mg/kg
Bromoform	< 0.50 mg/kg
2-Chloroethylvinylether	< 0.50 mg/kg
Tetrachloroethene	< 0.50 mg/kg
1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
Toluene	< 0.50 mg/kg
Chlorobenzene	< 0.50 mg/kg
Ethylbenzene	< 0.50 mg/kg
Styrene	< 0.50 mg/kg
Total Xylenes	< 0.50 mg/kg



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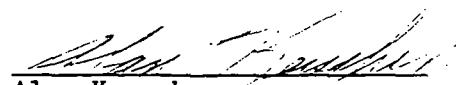
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3557
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	610 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	560 mg/kg



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LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (12:00 noon)
P. O. Box 330 COMPLETED: September 16, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3658
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Antimony	6.1 mg/kg
	Arsenic	< 3.0 mg/kg
	Beryllium	0.44 mg/kg
	Cadmium	3.1 mg/kg
	Chromium	12.3 mg/kg
	Copper	20.4 mg/kg
	Lead	34 mg/kg
	Mercury	< 0.1 mg/kg
	Nickel	19.4 mg/kg
	Selenium	< 3.0 mg/kg
	Silver	0.50 mg/kg
	Thallium	6.4 mg/kg
	Zinc	165 mg/kg
	Cyanide	0.14 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	9.0 mg/kg
	Aroclor 1260	240 mg/kg

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO on September 1, 1987 by Thomas E. Fuhrhop (Previous Project No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Phenol	< 330 µg/kg
	bis(2-Chloroethyl)ether	< 330 µg/kg
	2-Chlorophenol	< 330 µg/kg
	1,3-Dichlorobenzene	< 330 µg/kg
	1,4-Dichlorobenzene	< 330 µg/kg
	Benzyl Alcohol	< 330 µg/kg
	1,2-Dichlorobenzene	< 330 µg/kg
	2-Methylphenol	< 330 µg/kg
	bis(2-Chloroisopropyl)ether	< 330 µg/kg
	4-Methylphenol	< 330 µg/kg
	n-Nitroso-di-n-propylamine	< 330 µg/kg
	Hexachloroethane	< 330 µg/kg
	Nitrobenzene	< 330 µg/kg
	Isophorone	< 330 µg/kg
	2-Nitrophenol	< 330 µg/kg
	2,4-Dimethylphenol	< 330 µg/kg
	Benzoic Acid	< 1,600 µg/kg
	bis(2-Chloroethoxy)methane	< 330 µg/kg
	2,4-Dichlorophenol	< 330 µg/kg
	1,2,4-Trichlorobenzene	< 330 µg/kg
	Naphthalene	< 330 µg/kg
	4-Chloroaniline	< 330 µg/kg
	Hexachlorobutadiene	< 330 µg/kg
	4-Chloro-3-methylphenol	< 330 µg/kg
	2-Methylnaphthalene	< 330 µg/kg
	Hexachlorocyclopentadiene	< 330 µg/kg
	2,4,6-Trichlorophenol	< 330 µg/kg
	2,4,5-Trichlorophenol	< 1,600 µg/kg
	2-Chloronaphthalene	< 330 µg/kg
	2-Nitroaniline	< 1,600 µg/kg
	Dimethylphthalate	< 330 µg/kg
	Acenaphthylene	< 330 µg/kg
	2,6-Dinitrotoluene	< 330 µg/kg

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop (Previous Project
No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	3-Nitroaniline	< 1,600 µg/kg
	Acenaphthene	< 330 µg/kg
	2,4-Dinitrophenol	< 1,600 µg/kg
	4-Nitrophenol	< 1,600 µg/kg
	Dibenzofuran	< 330 µg/kg
	2,4-Dinitrotoluene	< 330 µg/kg
	Diethylphthalate	< 330 µg/kg
	4-Chlorophenol-phenylether	< 330 µg/kg
	Fluorene	< 330 µg/kg
	4-Nitroaniline	< 1,600 µg/kg
	4,6-Dinitro-2-methylphenol	< 1,600 µg/kg
	N-Nitrosodiphenylamine	< 330 µg/kg
	4-Bromophenyl-phenylether	< 330 µg/kg
	Hexachlorobenzene	< 330 µg/kg
	Pentachlorophenol	< 1,600 µg/kg
	Phenanthrene	< 330 µg/kg
	Anthracene	< 330 µg/kg
	Di-n-butylphthalate	< 330 µg/kg
	Fluoranthene	< 330 µg/kg
	Pyrene	< 330 µg/kg
	Butylbenzylphthalate	< 330 µg/kg
	3,3'-Dichlorobenzidine	< 660 µg/kg
	Benzo(a)anthracene	< 330 µg/kg
	Chrysene	< 330 µg/kg
	bis(2-Ethylhexyl)phthalate	< 330 µg/kg
	Di-n-octylphthalate	< 330 µg/kg
	Benzo(b)fluoranthene	< 330 µg/kg
	Benzo(k)fluoranthene	< 330 µg/kg
	Benzo(a)pyrene	< 330 µg/kg
	Indeno(1,2,3-cd)pyrene	< 330 µg/kg
	Dibenz(a,h)anthracene	< 330 µg/kg
	Benzo(g,h,i)perylene	< 330 µg/kg

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO on September 1, 1987 by Thomas E. Fuhrhop (Previous Project No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Pesticides	
	Aldrin	< 10 mg/kg
	Alpha-BHC	< 10 mg/kg
	Beta-BHC	< 10 mg/kg
	Gamma-BHC	< 10 mg/kg
	Delta-BHC	< 10 mg/kg
	Chlordane	< 10 mg/kg
	4,4'-DDT	< 10 mg/kg
	4,4'-DDE	< 10 mg/kg
	4,4'-DDD	< 10 mg/kg
	Dieldrin	< 10 mg/kg
	Alpha-Endosulfan	< 10 mg/kg
	Beta-Endosulfan	< 10 mg/kg
	Endosulfan Sulfate	< 10 mg/kg
	Endrin	< 10 mg/kg
	Endrin Aldehyde	< 10 mg/kg
	Heptachlor	< 10 mg/kg
	Heptachlor Epoxide	< 10 mg/kg
	Toxaphene	< 10 mg/kg
	Methoxychlor	< 10 mg/kg



LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)
P. O. Box 330 COMPLETED: September 8, 1987
Columbia, IL 62236-0330
ATTN: Jeffrey D. Young LLI NO.: 87-3557
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
6 SS #6	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
6 SS #6	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg

ROSE CHEMICAL

ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

APPENDIX F

Groundwater Sample Analytical Data

RECEIVED SEP 22 1987



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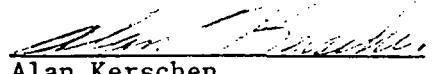
LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: August 28, 1987 (12:00 noon)
210 W. Sandbank Road COMPLETED: September 8, 1987
Columbia, IL 62236
ATTN: Jeffrey D. Young LLI NO.: 87-3507
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 201	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	0.087 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	0.740 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:


Alan Kerschen
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO
on August 28, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 201		
	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls Aroclor 1260	0.68 µg/liter

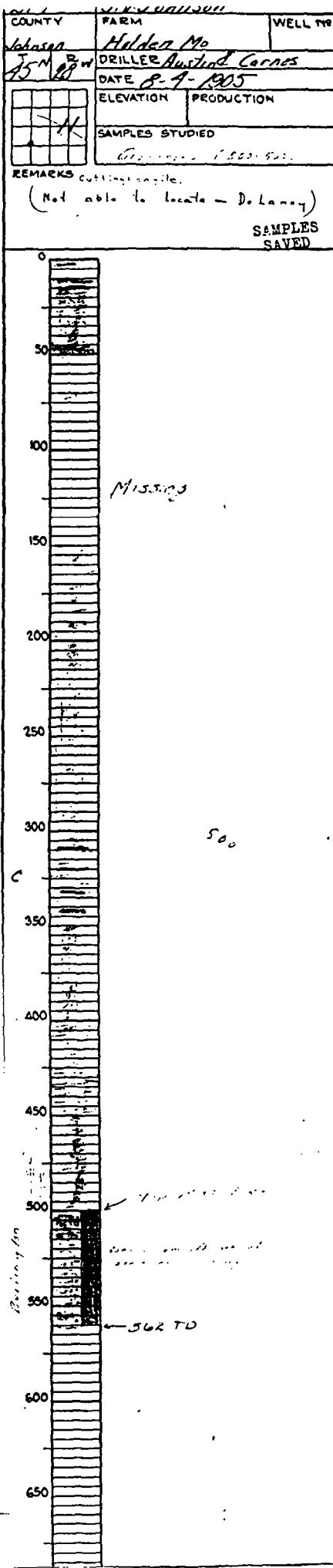
ROSE CHEMICAL

ADDENDUM NUMBER 1

PRELIMINARY SITE ASSESSMENT REPORT

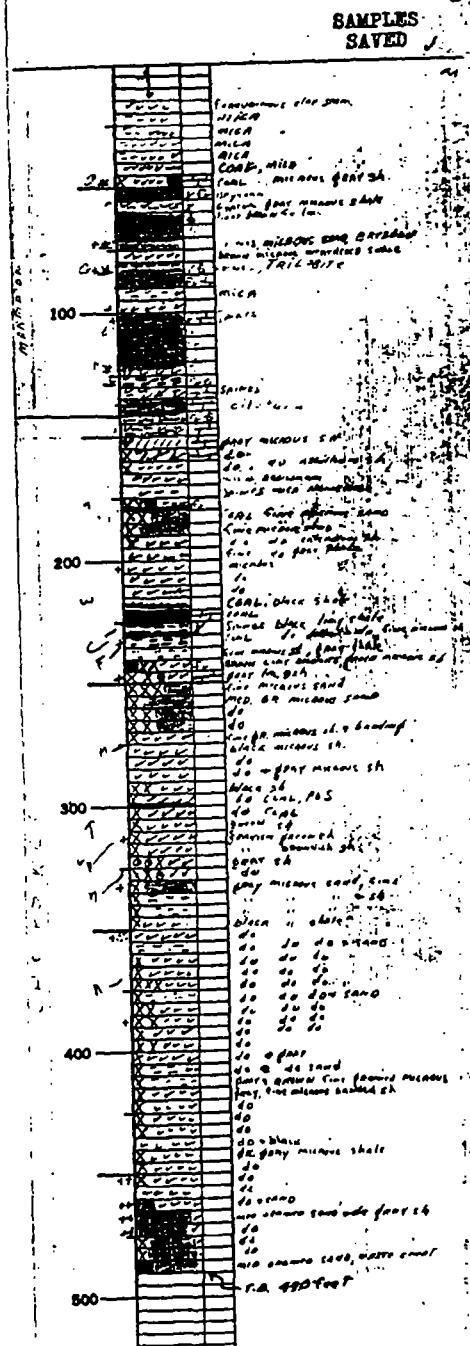
APPENDIX G

Copies of MDNR Well Logs



STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER	WELL NO.
15058	R.P. & C.C. Lewis	1
COUNTY	FARM	
Johnson		
T.M. 28	DRILLER W.F. Chester	
DATE 7-18-55 - 7-28-55		
ELEV.	PROD.	
561 within		
LOGGED BY S.R. Martinson		
10-35-55		
REMARKS		



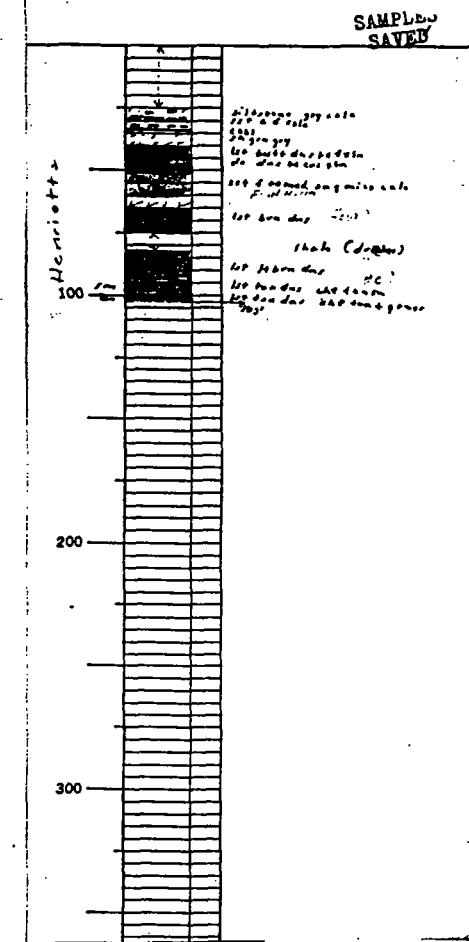
WL-44-5415

STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER
22956	A.H. Van Meter
COUNTY	FARM
Johnson	
T 45N R 28W	DRILLER W.R. Chisler
DATE	
ELEV. 918 ft. LOGGED BY C.E. Robertson Oct. 1964	
PROD. 10 G.P.M. INDEX SHEET NO. —	
REMARKS 220 ft. of 6 1/2 in. csg. Analysis on back	
Bin. hole @ bottom SWL 105 ft. ✓	
PERIODIC MORTION	

OKIES
STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER
10791	J.W. KESLERSON
COUNTY	FARM
Johnson	Do.
T 45 R 28	DRILLER Batch Bros.
DATE 9-6-97	
ELEV. 829 ft. LOGGED BY C.E. Robertson Oct. 1964	PROD. —
LOGGED BY McNeil 10/18/99	
REMARKS	

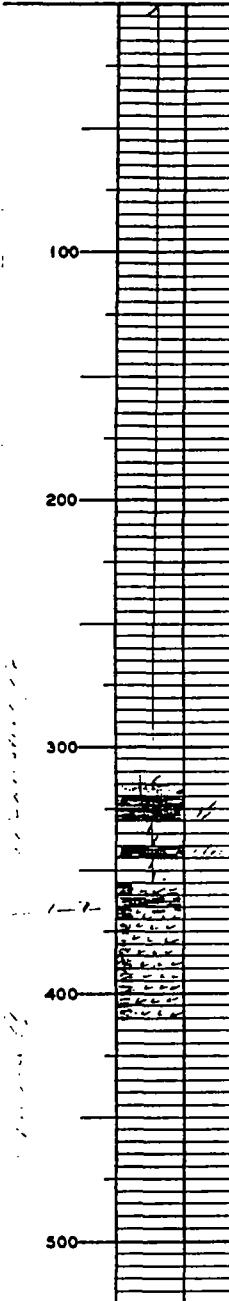


DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER
29296	City of Kingsville
COUNTY	FARM E.G. THOMAS
Johnson	WELL NO.
T R	DRILLER
45 28	DATE
	1961?
ELEV. ft. / m.	PROD.
943	
6	LOGGED BY
	C.E. ROBERTSON
REMARKS	

INDEX SHEET NO. ✓

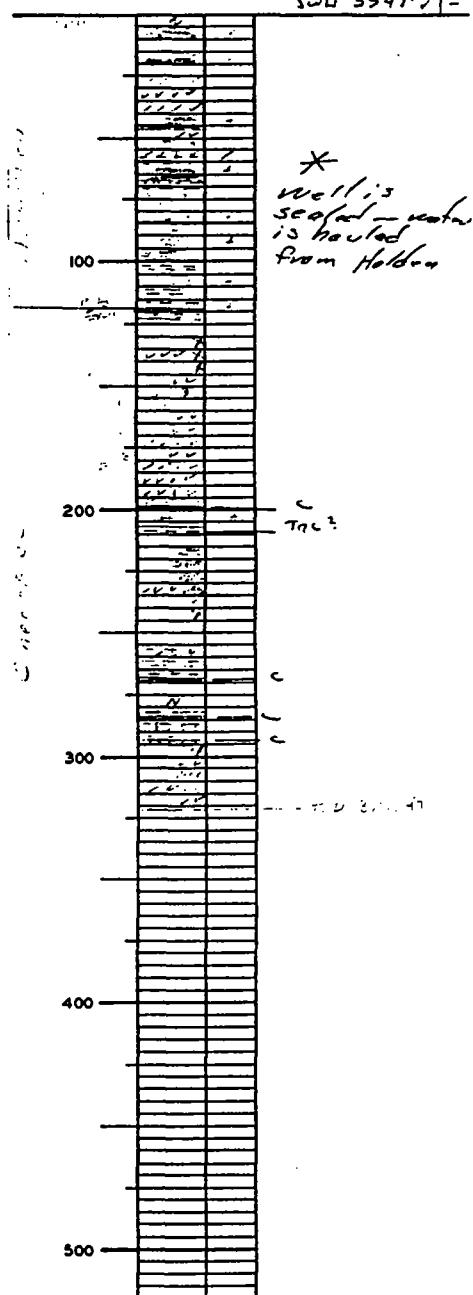
SAMPLES SAVED

STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER
24048	white men Airforce Base
COUNTY	FARM NEAR MINER'S BASE
Johnson	WELL NO.
T R	DRILLER Cullum & Brown
45 28	DATE Completed Feb. 2, 1966
ELEV. ft. / m.	PROD.
600	$3\frac{1}{2}$ G.P.M. *
	300 - 322
LOGGED BY	SWL 35 ft.
C.E. ROBERTSON	
MARCH 1966	
REMARKS	

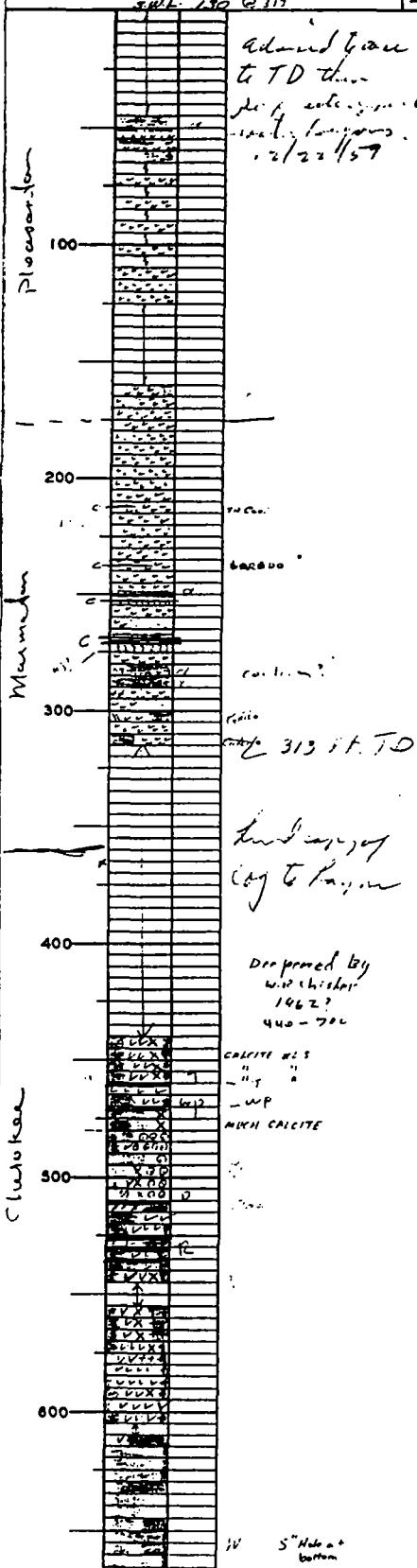
INDEX SHEET NO. ✓

SWL 35 ft. ✓



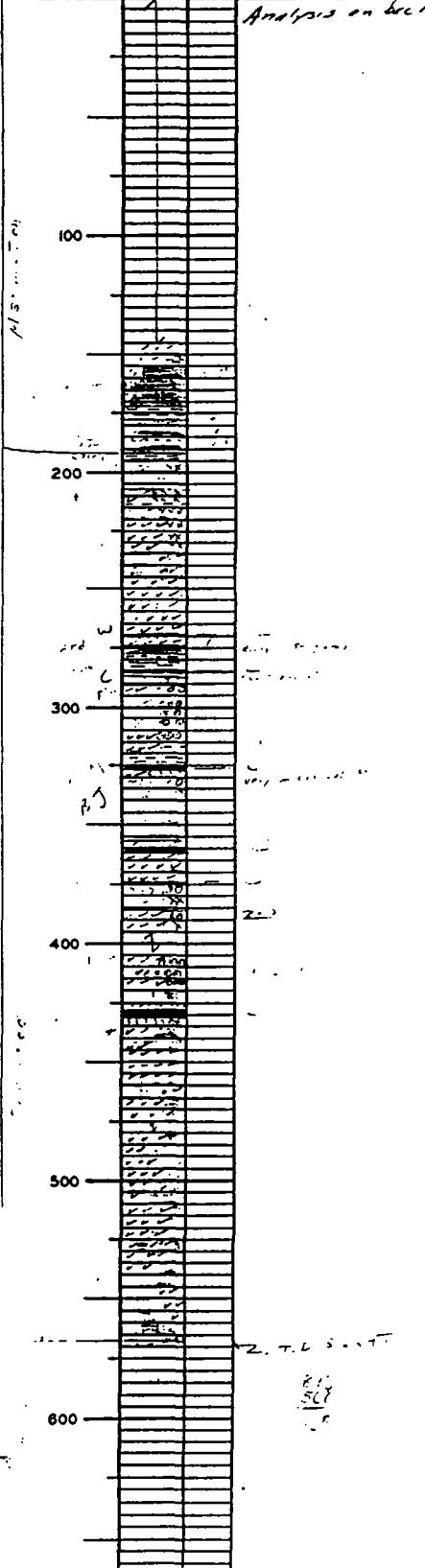
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO. 21199 18646	OWNER <i>Kingsville</i>
COUNTY Johnson	FARM <i>van meter</i>
T 45	R 28
DRILLER <i>W.R. Christian</i>	
DATE <i>Oct 20, 1980</i>	
ELEV. <i>1100 ft</i>	
PROD. @ <i>313'</i>	
LOGGED BY <i>water</i>	
<i>H.M. GROVES</i>	
REMARKS <i>8' hole to 37' 6" to 308' 5" to 313' water @ 308'</i>	
INDEX SHEET NO <i>12</i>	



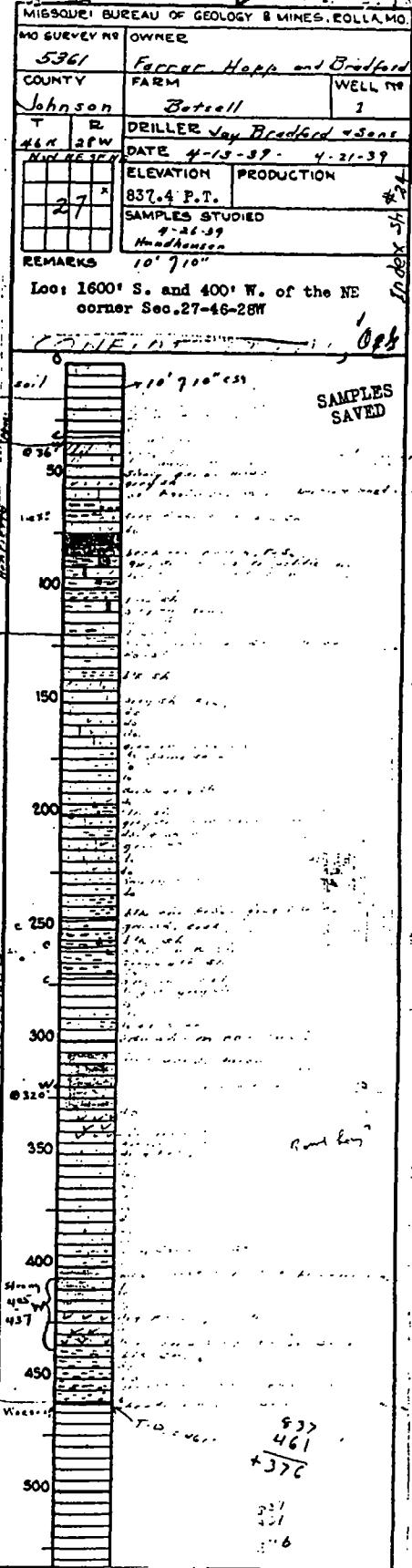
STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO. 22886	OWNER Leon MS Haney
COUNTY Johnson	FARM 1 mi. S of Mulden CITY LIMITS on 131
T 45N	R 28W
DRILLER W.R. Chisler	
DATE Completed April 11, 1964	
ELEV 896 feet	PROD.
LOGGED BY C.C. Robertson Nov. 1964	
REMARKS 40ft. of 6 1/2 in. + 385 ft. of 5 1/2 in. Casing + 186 ft. of 4 1/2 in. liner water: 528 - 568	
4 1/2 in. hole to bottom SWL 210 ft.	



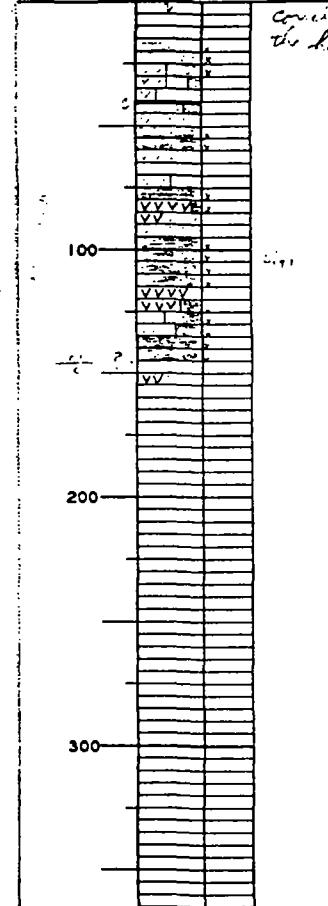
STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER
23,387	JACOB EISLER
COUNTY	FARM
JOHNSON	WELL NO.
T 45N R 28W	DRILLER W. R. CHISLER
	DATE JAN. 20, 1965
	ELEVATION PROD.
	823 15 G.P.M.
	LOGGED BY H. M. GROVES
	JUNE 3, 1965
REMARKS CSG: 155' OF 6 1/4"; 301' 7" OF 5 1/2". WATER: 400'-455'. Anhydrite on bottom. S.W.L. 130'. 6 1/4" HOLE @ BOTTOM.	
INDEX SHEET NO.	
RESIDUUM	1755
INTERVALS / DEPTHS	
100	
200	COAL
300	COAL
400	
500	
455	T.D. 12-455'
461	
466	
471	
476	
481	
486	
491	
496	
501	
506	



STATE OF MISSOURI WL-29-SPI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

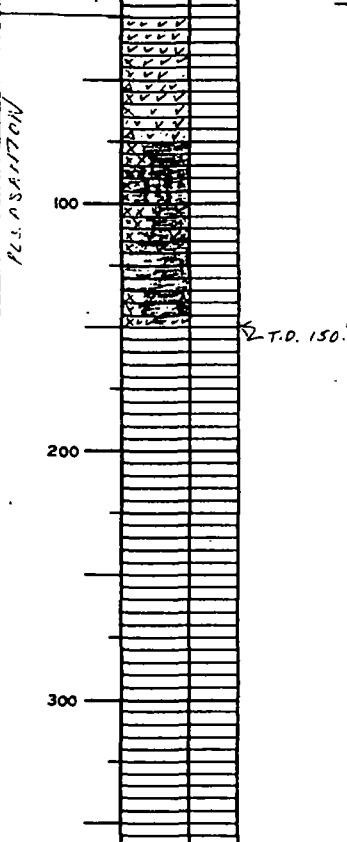
LOG NO.	OWNER
18265	DOUG JASPER
COUNTY	FARM
JOHNSON	
T R 45 28 W	DRILLER BURGESS & PRATER
DATE 6/15/69	
ELEV. 1150' PROD. 29	LOGGED BY H.M. GROVES 7/1/69
REMARKS CSG: 5 1/2' OF GALV. 674' Hole @ 60' S.W.L. 60'	
SAMPLES SAVED INDEX SHEET NO. 12	



STATE OF MISSOURI WL-30-SPI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER
25,761	GERALD COCKRAN
COUNTY	FARM
JOHNSON	
T R 45 N 28 W	DRILLER W.R. CHISLER
DATE MARCH 16, 1967	
ELEV. 1161' PROD. 29	LOGGED BY H.M. GROVES DEC. 3, 1969
REMARKS CSG: 21' f64'; 132' f57'. WATER: 120'-140'	
Analys's on back	

RESIDUUM CORREL. BY T.S. HILLS,
MAY BE WAPPENSBURG.

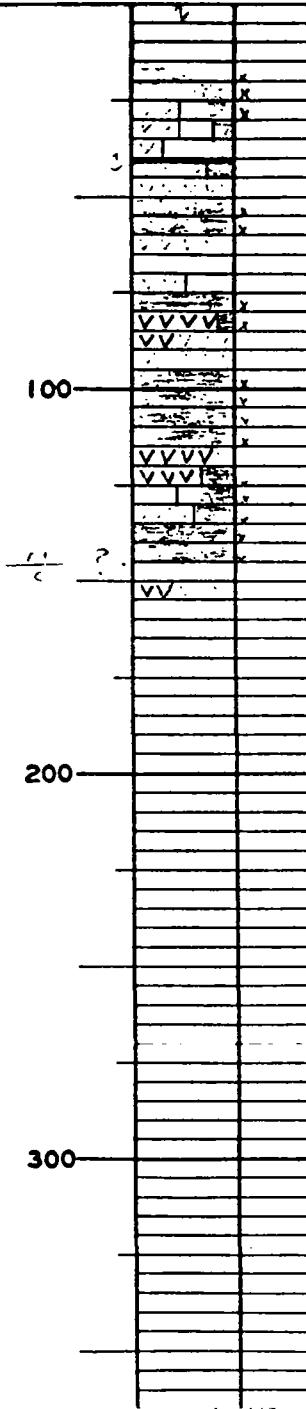


STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

WL-44-3418

WIS 30-SP15

LOG NO.		OWNER	
8265		DOUG JASPER	
COUNTY		FARM	WELL NO.
JHNSON			
T 45	R 28 W.	DRILLER BURGESS & PRATER	
DATE 6/15/59			
ELEV. 1118 <u>863</u>		PROD. 15 G.P.H.	
LOGGED BY H.M. GROVES 7/31/59			
REMARKS CSG: 5 1/2' OF GALV. 6 1/4" Hole @ Bottom			
S.W.L. 60'			
SAMPLES SAVED ✓			
INDEX SHEET NO. 12			



Conversations with
the Bishop of Ss. Peter & Paul,

INDEX SHEET NO. 12

STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER	
25,761	GERALD COCKRAN	
COUNTY	FARM	WELL NO.
JOHNSON		
T 45 N.	R 28 W.	DRILLER W. R. CHISLER
		DATE MARCH 16, 1967
ELEV. 11616 -		PROD.
852		5 G.P.M.
LOGGED BY H.M. GROVES DEC. 3, 1969		
REMARKS	CSG: 21' 6 1/4"; 132' 8 1/2". <u>WATER: 120'-140'</u>	

RESIDUUM A CORREL. BY T.S. WIGGS
MAY BE WARRENSBURG.

